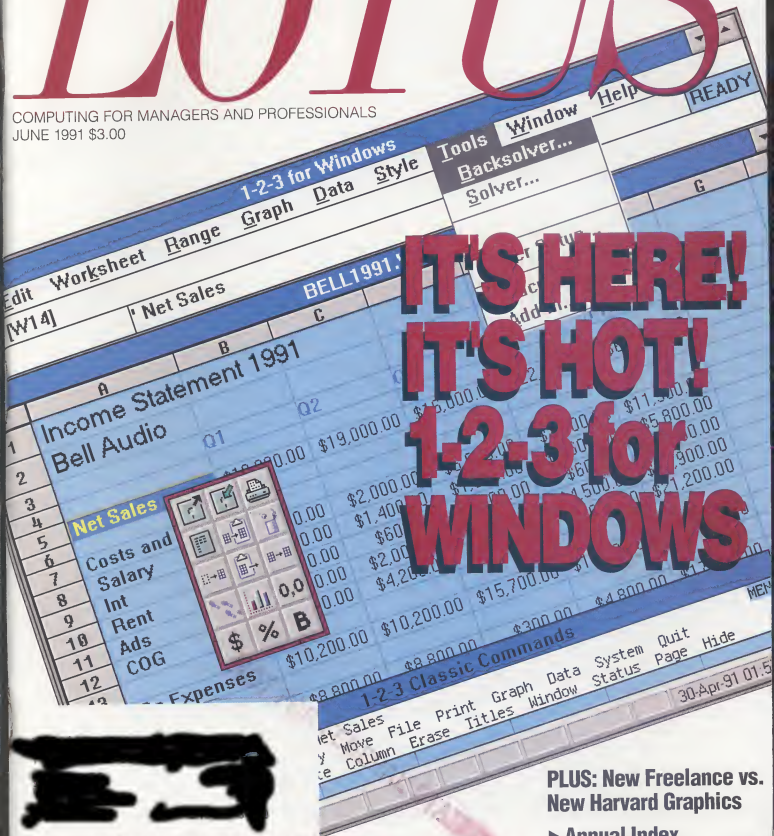


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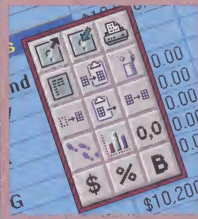
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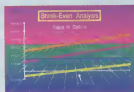
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FINE-TUNING RELEASE 3.1

Release 3.1 needs to be improved. First, the WYSIWYG:Print Layout Compression Automatic function works with only one page at a time. It should be redesigned so that it can compress several pages at once and automatically renumber the pages. Perhaps a function could be made to differentiate between a "hard" page break and a "soft" page break, as in some word-processing programs.

Second, users should be able to select colors from a palette. Picking colors by number is ludicrous, and I have yet to see any documentation, such as a table or a color chart, to explain the numbers.

Finally, the WYSIWYG:Format Lines menu should include the choice "Each Page" for placing single, double, wide, and other print borders around each worksheet page.

William C. Young
Commercial Investment Properties
Birmingham, Mich.

The editor replies: Lotus Development Corp. suggests that you insert hard page breaks to

automatically compress multiple pages at one time and to renumber the pages. To insert a hard page break, use the :Worksheet Page Row command. Lotus's product-development team will consider your other suggestions for upcoming releases.

TRACKING SPREADSHEETS WITH @NOW

Why did you leave out the @NOW function in "Make a Date with 1-2-3" [March, page 24]? I use this function in both the date and time formats on spreadsheets that I revise frequently. It ensures that I will always be able to tell the most recent revision.

Nancy Bougher
Electric Utility Department
Lodi, Calif.

The editor replies: Start Here covers just the basics, in a limited amount of space. The @NOW function in 1-2-3 returns a serial number representing the current date and time. Each time 1-2-3 recalculates the worksheet, it updates the date or time created by the @NOW function. To use the function to date-

stamp a worksheet, you need to "freeze" its result. To do so, format the cell for date or time and select /Range Value. Press Return twice to get the result of the formula, then save the worksheet.

DISKLESS COMPUTING IS BEST

Rich Friedman was correct in "Diskless PCs: Boon or Big Brother?" [March, page 98]. Control and responsibility must go together. When you have disks, personal software, and disk access to the network, you have the control, but the MIS group has ultimate responsibility for accuracy, security, and availability of LAN-based data. These two policies are at odds.

As for Fred Paul's comment that "if your MIS manager likes 1-2-3 and you like Symphony, you're out of luck," software decisions in a business environment are based on business needs, not individual preferences. When people choose their own packages, the MIS staff can provide only a low level of support. Most LANs are installed to standardize programs and increase support. Keeping local disk

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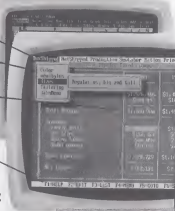
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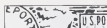
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Michael R. Prudhom
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Vernon Hills, Ill.

HOW STANDARD IS THE E-MAIL STANDARD?

When I asked MCI Mail about the new X.400 standard for data transfer between E-mail systems ["E-Mail Goes Global," February, page 14], I was told that although MCI Mail and EasyLink systems use X.400, transfers between the two services are still handled as telex transfers, at much slower speeds and higher costs to users. Your article implied a more efficient link.

Kenneth Bush
Indianapolis, Ind.

The editor replies: An MCI spokesman insists that there is an X.400 link between MCI Mail and Western Union's EasyLink, although transmissions between the two can also be handled as telex transfers. For more information on how to send an MCI Mail message via the X.400 connection to an EasyLink address, either type view and then x400 at the MCI command prompts, or call 800-444-6245 to reach MCI Mail's voice help line.

GERR

Because of screen-capture problems, the colors in the *Freelance Graphics for DOS* image in the April @LOTUS column on page 20 are not the actual colors. The correct image appears in the review "Harvard Graphics vs. Freelance," in this issue.

In "Formulas have rights too" (April Good Ideas, page 70), we presented one formula that copies a right-aligned label and another that combines two right-aligned labels into one cell. The second formula is missing an ampersand. It should read:

```
@REPEAT(" " @CELL("width",D1)
--I--@LENGTH(A2&" " &B2))
&A2&" " &B2
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In the April review of *The Mobley Matrix*, the telephone number for Mobley Matrix International is incorrect. The Los Angeles company can be reached at 800-777-8181.

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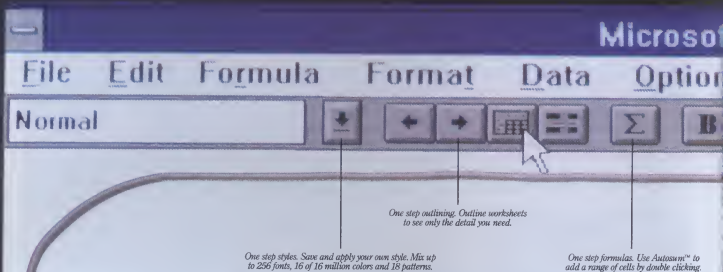
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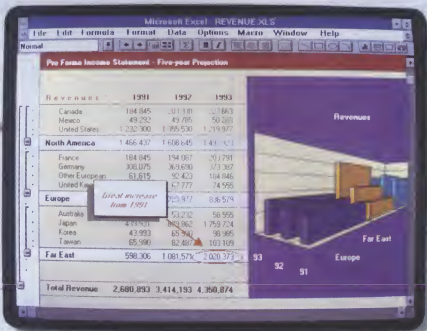
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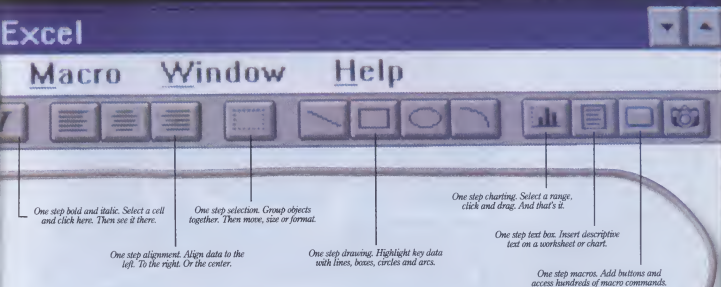
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Intel Banks on the '486's SX Appeal

But is the new chip good enough to dethrone the '386?

If the buzz of activity at Comdex/Spring is any gauge, the PC industry has a new sweetheart: the 486SX microprocessor. IBM, Hewlett-Packard, Olivetti, AST Research, and Advanced Logic Research are among a crowd of manufacturers following closely on the heels of Intel Corp.'s April 22 486SX announcement with computers built around the new component.

Just as the 386SX served as a stepping stone between the '286 and '386 platforms, so Intel hopes the 20MHz 486SX will jump-start sales of its high-end chip line. Intel's announcement is carefully timed, industry insiders say. Following a recent court ruling that allows competitor American Micro Devices (AMD) to market its own '386 chips, Intel is more interested than ever in moving users to the '486 platform, over which it still holds a monopoly.

The new SX is a slower, lower-cost '486 chip minus a built-in floating-point calculation unit. Since Intel originally touted internal floating-point calculations as one of the '486's principal advantages, the removal of the math capabilities creates the potential for buyer confusion, according to computer makers and industry analysts.

Intel officials are taking pains to give buyers reasons for moving to the '486 design. An on-chip memory cache, built-in multiprocessing capabilities, refined silicon technology, and an increased number of instructions per clock cycle are among the features that give '486 processors—including the new SX—an ad-

vantage over '386 chips, explains Nancy Pressel, a spokeswoman for Intel in Santa Clara, Calif.

That advantage can be significant for users of certain kinds of software. Some 32-bit applications can show as much as a 45% increase in performance between the 33MHz '386 and the 20MHz 486SX, according to Intel benchmark calculations. However, increases are less dramatic for 16-bit applications, which represent the overwhelming majority of PC software. Intel tests show only a 4% gain in performance for the 486SX over the 33MHz '386 *I-2-3* Release 3 benchmarks, for example, and an 11% improvement on the Power Meter spreadsheet benchmarks.

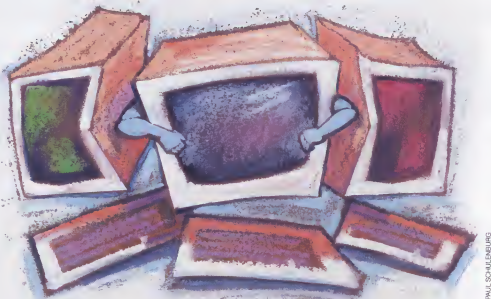
Performance uptick. "In the here and now, the performance gain over the 33MHz '386 is minimal," says Bruce

Stephen, director of PC hardware research at International Data Corp. (IDC), a Framingham, Mass., market research firm. "But in exchange for a slight uptick in performance, you get a cache and other '486 improvements that will carry

into the next couple of years." The 486SX will be a chip for machines that run *Windows* or multitasking applications, or it will be an entry point to 32-bit software, he says.

But until those kinds of applications reach critical mass, most industry players believe the choice between a 33MHz '386 and a 486SX machine will come down to cost, particularly for users who don't need the benefits of the '486's math coprocessor. Initially, 486SX machines will be somewhat pricier

than PCs built around the 33MHz '386, predicts Stephen, "but over time that price will come down. We expect they'll



PAUL SCHULenburg



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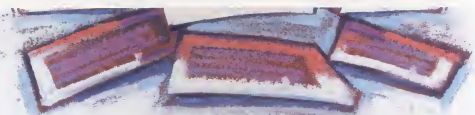
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[eventually] come in at around the same price point," he says. IDC projects that 120,000 486SX products will be shipped in 1991, with 550,000 units going out the door in 1992. Dave Kirkey, vice president of worldwide marketing and international sales for Advanced Logic Research (ALR) in Irvine, Calif., predicts that buyers now loyal to the 33MHz '386 will eventually move to the 486SX. That transition, however, could take six months to

a year and a half.

ALR is offering 486SX options in three of its product lines: the PowerFlex series of industry-standard architecture PCs; the BusinessVEISA line, which sports the Extended Industry Standard Architecture, and the MPS series of Micro Channel units.



IBM is using Intel's 486SX chip in its PS/2 Model 90 XP series.

The 486SX versions of those machines will cost, respectively, less than \$2,000, \$2,800, and \$3,000, Kirkey says. A 20MHz 486SX BusinessVEISA unit will cost \$2,795, for example; the 33MHz '386 version with a 64K cache costs \$2,595.

AST Research, also in Irvine, will offer a 486SX machine as part of its Premium II line of midsize PCs. A base 486SX unit without a hard drive will cost between \$3,500 and \$4,000, according to product marketing manager William Greenlund.

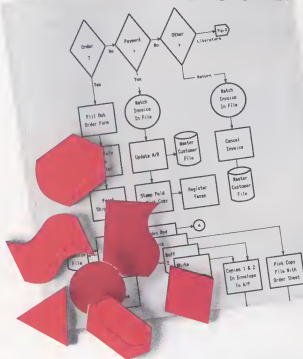
With prices in the same range as '386 PCs, it's only a matter of time before the tide turns toward the '486. "My crystal ball's no better than anyone else's," Greenlund warns, "but it's natural that the '386, both 20MHz and 33MHz, will begin to give way to the 486SX at some point." Even so, Greenlund is careful not to write off the marketing power of the '386 product line. "Out to a year, we're still with the '386, particularly the SX machines. [The '386 chip] is on a lot of corporate buy lists," he points out.

Mindful of the '386's popularity, at least one computer maker is hedging its bets. Until Arche Technologies can take an accurate reading on market demand and chip availability, the company is taking a wait-and-see attitude on the 486SX, says Mike Bruzzone, spokesman for the Fremont, Calif. firm. Arche has a 486SX board in its labs and will move forward once it is assured Intel can supply enough chips to make building 486SX PCs a cost-competitive venture.

In the longer term, the consensus among analysts is that '386 buyers will move to the '486 processor. No one would welcome that changeover more than Intel. After enjoying a monopoly in the '386 market for several years, the microprocessor giant now faces a challenge by AMD and other chip makers. While Intel curiously declines to draw a connection between AMD's plans and the introduction of the 486SX, the company will clearly rest more easily if the '486 becomes the new darling of the desktop.

—Tracy Mayor

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LANs MAY YET DELIVER ON THEIR PROMISE

Only a lack of applications holds them back.

In the climactic scene of the movie *True Grit*, a portly, patch-eyed John Wayne faces a quartet of villains across an open field and calmly instructs them to surrender. Amused at the Duke's bravado, Robert Duvall, the leader of the desperados, retorts, "Bold talk for a one-eyed fat man."

In a sense, PC network vendors were the one-eyed fat men of the 1980s, boldly trumpeting the benefits of connectivity while apparently in no position to deliver much more than file sharing and printer sharing. But these vendors may yet wind up like the Duke—a little the worse for wear, but vindicated. That's because this decade promises real advances in the information-sharing capabilities of local area networks and in the software needed to take advantage of them.

By the end of the 1980s, roughly 650,000 LANs were installed in the United States, according to the market research firm InfoCorp/Gartner Group (Santa Clara, Calif.). More than 60% of them use Novell's *NetWare* network operating system. A bit more than 15% use Microsoft's network operating systems, and systems

from 3Com, Banyan Systems, and Apple Computer account for most of the rest of the market. Typically, however, small groups of workers use these networks simply to share a big hard disk (the file server) and peripherals (laser printers, color plotters, high-speed modems, and so on).

Beyond printer sharing. The basic file- and printer-sharing network doesn't begin to tap networking's potential to foster broad, sophisticated information sharing and communication, say LAN customers and sellers. Although it's certainly possible to create a network in which users can, for example, instantly summon data that resides anywhere in the company (on local PCs or on interconnected LANs) and coordinate group projects electronically, many users agree that such a network is not yet very practical.

Possibility won't become practicality until a few more pieces of the network puzzle fall into place. Many of those pieces involve improvements in the basic elements of networking: faster file servers, easier installation, and better bridges to computers beyond the LAN. But the key missing piece is applications software that can turn technical achievements into real-world gains at the desktop.

Many packages have been adapted to work satisfactorily within a networked environment, but precious few programs are designed to help groups of people work together on a network. This so-called groupware differs from conven-

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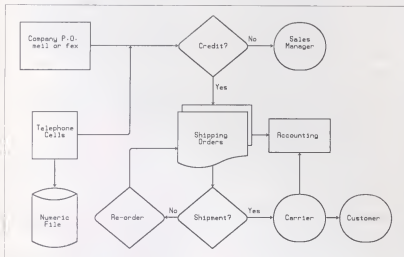


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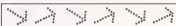
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tional software mainly in its emphasis on group or departmental functions that require a great deal of data sharing and communication across a LAN. Aside from some electronic-mail and group-scheduling packages, the groupware shelf has been virtually bare.

Lotus Notes, Lotus Development Corp.'s network information and communication manager, is the most visible exception to the groupware void. But even a flexible program such as *Notes* (version 2.0 was released in February), which can pass text and graphics across a network in a variety of forms, is only one part of the applications mix needed for a total solution.

A tough sell. It's a classic chicken-and-egg problem: The lack of compelling applications has held back investment in LANs, which, in turn, has discouraged developers from funding complex and expensive groupware projects. "It's hard to get people to invest in networks without a driving application," agrees Irene Greif, manager of work-group technology

FILE AND PRINTER SHARING DOESN'T BEGIN TO TAP NETWORKING'S POTENTIAL.

gies at Lotus, "but it's hard to generate much enthusiasm for writing such an application without the networks in place."

"We're still looking for the application that will really sell top management on LANs," says Robert Payne, who heads a group that stipulates network guidelines at the Du Pont Co.'s headquarters in Wilmington, Del. "There's a strong feeling that we're not getting all we should out of the LANs we already have."

But several new startups, as well as most of the big software developers, are reportedly working on groupware projects that will bear fruit within a year or two. In some cases, these efforts will result in such built-from-scratch applications as *Notes*. Well-established programs, such as *1-2-3*, will generally acquire new



networking capabilities through upgrades, add-ons, or companion products. "Making the transition to work-group software is a big step, but it doesn't have to mean throwing away everything that went before," insists Lotus's Greif.

Building on its experience in developing *Notes*, Lotus is working on new ways to share 1-2-3 data across a network (see "Spreadsheets That Help Groups Get Connected," March 1990, page 9). Among the objectives: Make exchanging worksheet data easier, automate the process of consolidating multiple spreadsheets, and trickiest of all, enable LAN users to share a single spreadsheet the way they might now share a single database.

Shifting the burden. Underpinning many of these software efforts (including *Notes*) is a change in the basic functional structure of LANs. In contrast to conventional file-server arrangements, in which files are stored centrally but PCs still do much of the information processing, the client-server networking model puts most of the processing burden on the server, which is often dedicated to a specific purpose, such as database management or communications.

"This is a fundamentally different idea," says David Thacher, senior product manager for Microsoft's LAN Manager. "You're not just sharing your files or printers, you're sharing a computing engine." Through joint ventures with other firms, Microsoft already offers a pair of such engines: a communications server, and a database server that uses the SQL database query language.

Ideally, this new form of computing will look a lot like the old form. People using 1-2-3 on a network with an SQL database server, for instance, might have far greater access to financial data, yet see little or no change in the way 1-2-3 operates. "The beauty of [the client-server model] is the user doesn't have to know or care that he's using a front end to something at the server," says Mike Murray, general manager of Microsoft's network business unit. "He simply sees an application like 1-2-3 or *Excel*."

Better connectivity. Novell, too, talks about the future in client-server terms. The big challenge, says Mark Calkins, formerly vice president of marketing for *NetWare* products, is getting vendors to work together so that applications will work seamlessly across a wide range of servers, network operating systems, and workstations, including DOS, OS/2, Unix, and Macintosh machines. "Complete interoperability at the applications level is tough," Calkins admits. "It'll take time."

But without such unity in the background, LANs are unlikely to deliver on the client-server promise of easier, faster sharing of information. "You can't be half pregnant with this stuff," says Microsoft's Murray. "You have to have tight integration for this to work."

Because networks are still so new to many businesses, suppliers should have a couple of years to resolve such thorny issues before corporate grumbling about limited LAN functions escalates into outright demands. But expanded use of LANs and a steady increase in their size will pressure vendors. The average number of computers per LAN today is about 12; by 1994, that number will rise to 20, predicts market research firm International Data Corp. (Framingham, Mass.).

"Most networks today are small setups serving simple needs, but that's changing," notes IDC analyst Susan Frankle. "As LANs get larger, customers will demand increasingly sophisticated solutions because they'll have increasingly sophisticated problems," she says.

In the meantime, without much enticing work-group software to tempt them, many company managers are taking a wait-and-see attitude. "We're still in the early stage of network use, still getting comfortable with it," says Gregory Chetel, director of systems planning and research at the Gillette Co.'s Boston headquarters, which runs Novell *NetWare* 286 on its LANs to share files and peripherals. "Until we see a big payoff in something else, we'll move ahead very cautiously."

—Christopher O'Malley

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Worksheet Shortcuts

Use @SUM, Range Erase, and the Worksheet Insert commands to shorten tedious tasks.

BY KELLY R. CONATSER

As your worksheets expand, you'll want to take advantage of the many shortcuts that *1-2-3* provides for oft-performed tasks, such as summing entries, erasing cells, and inserting extra columns and rows. This month we'll expand and edit the worksheet in figure 1 to demonstrate these features.

If you created and saved last month's worksheet, retrieve it now. Start *1-2-3* and then press slash (/) to call *1-2-3's* menu. Select File Retrieve from the menu. If necessary, use the Backspace key to edit the path name that *1-2-3* displays after the prompt *Name of file to retrieve* so that *1-2-3* looks in the drive and directory where you saved the file. Enter *first*, which is the name of the file. Then go on to the next section of this article.

If you need to create the worksheet from scratch, start *1-2-3*. Enter the labels in ranges B1..E1, A2..A3, and A5, and enter the numbers in range B2..E3. Enter the formula 100+50 in cell B5. Enter the formula +C2+C3 in cell C5. Press the slash key (/) to call *1-2-3's* menu. Select Copy. *1-2-3* displays the prompt *Enter range to copy FROM: C5..C5*. Press Return. Then *1-2-3* displays the prompt *Enter range to copy TO: C5*. Move the cell pointer to cell D5, press the period key, press the RightArrow key once, and then press Return. Finally, select /File Save, enter *first*, and press Return.

ADDING FORMULAS

Row 5 of the worksheet in figure 1 contains formulas that compute the total number of bottles and cans for each region. You can learn more about the bottle and can data if you create formulas in column F that sum the number of bottles for all regions and the number of cans for all regions. In addition, you can create a formula in cell F5 that sums all of the bottle and can totals in row 5.

To begin, move the cell pointer to cell F1 and enter the label *Totals*. Now move the cell pointer to cell F2. To total the eastern, western, southern, and northern bottle data, located in cells B2, C2, D2, and E2, you could use the formula +B2+C2+D2+E2. However, a superior approach is to employ *1-2-3's* most widely used @function: @SUM.

The @SUM function is one of more than 80 built-in @functions, each of which has a specific syntax and performs a special calculation. For example, @SUM has the syntax @SUM(*list*), and as its name suggests, it adds

all the values in the list you specify. The list can include range references, cell references, named ranges, formulas, and values.

To see @SUM at work, enter the formula @SUM(B2..E2) in cell F2. *1-2-3* returns a result of 315.

The result of an @SUM formula—and for that matter, the result of any *1-2-3* formula—changes automatically when you change any value in the range specified in the formula. For example, change the number of bottles in

	A	B	C	D	E	F
1		Eastern	Western	Southern	Northern	
2	Bottles	100	90	100	25	
3	Cans	50	75	75	50	
4						
5	Total	150	165	175	75	

Figure 1.

the *Western* column from 90 to 100. The @SUM formula in cell F2 immediately returns the new total of 325.

Similarly, when you copy a formula to another cell, the range in the formula adjusts to the formula's new location in the worksheet. To see how this works, move the cell pointer to cell F2 and select /Copy. Press Return to specify cell F2 as the From range. Then move the cell pointer to cell F3, press the period key, press the DownArrow key twice, and press Return. Using the Copy command, you automatically create formulas that calculate the total number of cans (cell F3) and the total number of bottles and cans together (cell F5).

You might wonder why cell F4 now contains a zero. That cell contains the formula @SUM(B4..E4). Cells B4, C4, D4, and E4 contain no data, and to *1-2-3*, a blank cell has the value zero.

A BIG ERASER

What if you want to get rid of the contents of one or more cells? You can use the Range Erase command. Or you can write over the contents of a cell, thereby replacing existing data with new data.

The first method—namely, the Range Erase command—is useful when you want to delete an entry and not replace it with another entry. In the sample worksheet, the contents of cell F4 are useless. Move the cell pointer

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Elegance 486/25i, Sept. 11, 1990
Elegance 486/33i, Feb. 12, 1991



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*InfoWorld, July 30, 1990. †† PC Magazine, September 11, 1990.

to cell F4 and you'll see that it contains the formula @SUM(B4..E4), a formula that sums four blank cells.

To erase cell F4, select /Range Erase. I-2-3 responds with the prompt *Enter range to erase: F4..F4*. To expand the range to erase, use the Arrow keys. Since you want to erase the contents of only the current cell—that is, cell F4—just press Return. The cell is now blank.

Some I-2-3 users believe that moving the cell pointer to an expendable cell, pressing the Spacebar, and then pressing Return is an acceptable alternative to using the Range Erase command. This is a false assumption, since the cell only *appears* to be blank. In fact, it still contains a space character, which generates problems as the worksheet gets more complex.

Now try the second method of erasing data: writing over the contents of a cell. Move the cell pointer to cell B5. The status line in the upper-left corner of the display shows that this cell contains a simple formula: 100+50. This entry adds the current number of bottles and cans in the *Eastern* column. But unlike the other formulas in row 5, which are composed of cell references, it cannot automatically reflect any change in the eastern data.

To make this formula like the other formulas in row 5, replace the contents of cell B5 with a copy of the formula in cell C5. Move the cell pointer to cell C5. Select /Copy. I-2-3 displays the prompt *Enter range to copy FROM: C5..C5*. Since you want to copy only cell C5, press Return. Then I-2-3 displays the prompt *Enter range to copy TO: C5*. Since you want to copy cell C5 to cell B5, move the cell pointer to cell B5, and press Return. The status line now shows that cell B5 contains the formula +B2+B3, instead of the expression 100+50.

You could have accomplished the same objective by moving the cell pointer to cell B5, typing +B2+B3, and pressing Return. Both copying data on top of existing data and entering new data on top of existing data effectively "erase" the original contents of a cell and replace it with the new data.

A FIFTH COLUMN

Suppose you want to include a fifth column of data, for the central region, between the *Western* and *Southern* columns of your worksheet. You could use the Move command to move the *Southern*, *Northern*, and *Totals* columns to the right. But the Worksheet Insert Column command accomplishes the same task more quickly.

To insert a blank column between the *Western* and *Southern* columns, move the cell pointer to any cell in column D. Select /Worksheet Insert Column. I-2-3 responds with the *Enter column insert range* prompt, followed by the single-cell range address of the current cell. To insert more than one column, you press the LeftArrow or RightArrow key to expand the range. To insert only one column, just press Return.

I-2-3 creates a new, blank column D. The data that was in columns D through F shifts to the right and is now in columns E through G. Enter the label *Central* in cell D1. Enter the value 25 in cell D2, and enter the value 35 in cell D3. As you enter these values, notice that the @SUM formulas in column G automatically recalculate to account for the values that you just entered.

Move the cell pointer to cell G2 and look at the status line. The formula that formerly read @SUM(B2..E2) now reads @SUM(B2..F2). When you insert a column within the formula range, I-2-3 assumes that you want to include the new column in that range and automatically adjusts the formula.

I-2-3 makes a similar assumption if you delete a column within a range used in a formula. Move the cell pointer back to any cell in column D. Select /Worksheet Delete Column. I-2-3 responds with the *Enter range of columns to delete* prompt, followed by the single-cell range address of the current cell. To specify additional columns to delete, you press the LeftArrow or RightArrow key. For now, press Return to delete column D.

The central column and its data disappear. The @SUM formulas move from column G back to column F, and I-2-3 automatically adjusts them to account for the deleted column of data.

A ROW BY ANY OTHER NAME...

I-2-3 lets you insert and delete rows with two simple commands: Worksheet Insert Row and Worksheet Delete Row.

To see how the Worksheet Delete Row command works, move the cell pointer to cell A4. Row 4, which separates the bottle and can data in rows 2 and 3 from the totals in row 5, appears to be blank. To make sure, press the End key, then press the RightArrow key. If the row is blank, the cell pointer moves to column IV, indicating that there are no entries in row 4 between column A and the far right edge of the worksheet. If the row is not blank, the cell pointer stops at the first cell that contains data. This gives you a chance to change your mind about deleting that row. Since row 4 is blank, the pointer lands in cell IV4. Press the End key, then press the LeftArrow key to return the cell pointer to cell A4.

Select /Worksheet Delete Row. I-2-3 responds with the prompt *Enter range of rows to delete: A4..A4*. Since you want to delete only row 4, press Return. The bottle and can totals now appear in row 4 instead of row 5. Move the cell pointer to cell C4. The status line in the top-left corner of the display shows the contents of cell C4: +C2+C3. Deleting the blank row didn't change the formula that totals bottles and cans in the *Western* column.

The Worksheet Delete Row command, as well as the Worksheet Delete Column command, can ruin a lot of your hard work. Remember that the commands delete

the *entire* row or column. You can lose data in another area of the worksheet if you fail to make sure that the entire row or column contains no data *before* you issue the command. For example, assume that you deleted row 2. (Don't actually do this.) The formulas in row 4 move to

	A	B	C	D	E	F
1		Eastern	Western	Southern	Northern	Totals
2	Bottles	100	100	100	25	325
3	Cans	50	75	75	50	250
4						
5	Total	150	175	175	75	575

Figure 2.

row 3 and immediately evaluate to ERR, indicating an error in the calculation. This occurs because the formulas refer to cells in row 2 that the Worksheet Delete Row command just wiped out.

Now you might wonder: Why was I able to use the Worksheet Delete Column command to eliminate the central column? That operation worked without a hitch, causing no ERRs in the @SUM formulas in column F.

The key lies not in the command but in the formula itself. If a formula contains a *specific* reference to a column or row in the worksheet, the formula will evaluate to ERR if you delete that column or row. But if

the column or row is only *implied* in the formula, no error will occur.

For example, consider the formula @SUM(B2..F2). If you delete column B or column F, the formula evaluates to ERR because one of the columns specifically cited in the formula has been destroyed. But if you delete columns C, D, or E—or all three of them—1-2-3 still has the points of reference necessary to calculate the formula. 1-2-3 adjusts the formula to reflect the deleted columns without generating an error.

After viewing the worksheet, you might decide that it would be easier to read if there were a row separating the data and the totals. To replace the blank row that you just deleted, position the cell pointer in cell C4, then select /Worksheet Insert Row. 1-2-3 responds with the prompt *Enter row insert range: C4..C4*. Press Return to insert a single row. Your worksheet should look like the one in figure 2.

Now save the file so that you can use it next month. Select /File Save. 1-2-3 displays the *Enter name of file to save* prompt, followed by the drive, the path name, and the file name FIRST. Press Return, then select Replace from the menu. 1-2-3 saves the file. **■**

Kelly R. Conatser is a free-lance writer in Boston and a contributing editor to LOTUS.

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Loopy Macros

When you want a task done repeatedly,
don't get bored, get a macro.

BY NICHOLAS DELONAS

Worksheet tasks are recurrent.

Why else would anyone write a macro? Repetition is the very *raison d'être* of macros, which make recurring jobs easier and less time-consuming. In fact, the more repetition you can hand over to a macro, the less routine work you have to do yourself. Say, for example, that you need to erase all of the unprotected cells in a column. You could create a macro routine, \e, to erase the current cell, if it's unprotected, and then move the cell pointer down one row. Simply use the command [IF@CELLPOINTER("protect")=0]/RE~, followed by a {DOWN} command in the next row.

A novice programmer might rerun such a macro by hand (pressing MACRO-E over and over) or copy the same line of code down a column so that the macro runs copies of the same instructions again and again. The first technique wastes your time and energy; the second technique wastes memory and increases the size of the worksheet.

The best way to handle a problem like this is to use a looping macro. In 1-2-3, looping macros usually come in two basic flavors: vanilla (macros that branch to themselves) and chocolate (macros that use the {FOR} command). You'll get a taste of both in this column. You'll also get to sample two more exotic flavors: strawberry



(create a "while" command) and tangerine (create a "do-while" command).

HERE WE GO LOOP-THE-LOOP

To see how the looping techniques in 1-2-3 work, start with the simple macro routine shown in figure 1. The *stuff* routine enters a random integer between 0 and 10 in the cell named *var*. To help show how often this routine enters the value 5 in *var*, the formula in the cell named *test* returns 1 if *var* equals 5, and 0 otherwise.

Enter the labels as shown, omitting the text in red (cell B3). Begin the entry in cell A8 with an apostrophe. Use the Range Name Labels Right command to assign the labels in range A1..A8 as names for the adjacent cells in column B. Finally, enter the formula +var=5 in cell B3. To run the macro, hold down the MACRO key (Alt on most computers) and press G.

The macro enters some integer from 0 to 10 in *var*. The macro also increases the value, if any, in the cell named *count* by one. Repeatedly press MACRO-G until *var*

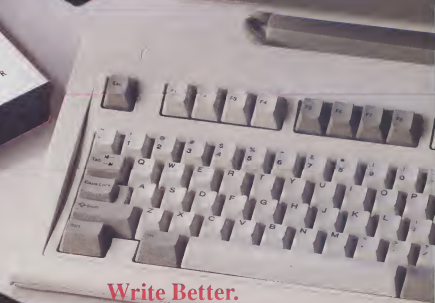
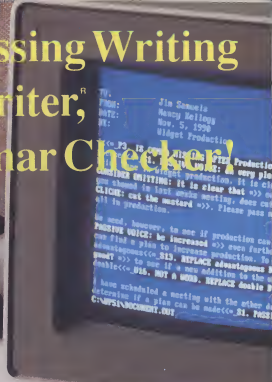
	A	B	C	D	E	F
1	count					
2	var					
3	test	0				
4						
5	stuff	(LET var,@ROUND(@RAND*10,0))~(RECALC test)				
6		(LET count,count+1)				
7						
8	\g	(stuff)				

Figure 1. One way to repeatedly execute a macro routine is by hand. You can run *stuff* again and again by holding down the MACRO key (Alt on most computers) and pressing G repeatedly.

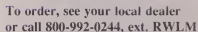


The model described in this article is available on disk. See page 1 for details.

Int
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The image shows two overlapping boxes for the RightWriter software. The top box is white with a black border and features the text: "The world's first intelligent word processing software", "RightWriter", "The intelligent word processor", "RightWriter", "The intelligent word processor", "RightWriter", "The intelligent word processor". Below the boxes is a small box for Lotus SmartSuite, which has a black background with a white sunburst logo and the text "Lotus SmartSuite".

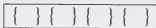


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equals 5 and the formula in *test* returns 1.

Here's how the macro works:

`{LET var,@ROUND(RAND*10,0)}{RECALC test}` enters a random integer between 0 and 10 in the cell named *var*. The macro then recalculates the formula in *test*, which determines if the new value in *var* equals 5.

`{LET count,count+1}` increases the value in the cell named *count* by one.

You may have to press MACRO-G quite a few times before getting a 5 in *var*. To avoid all those keystrokes, make the `\g` macro a looping macro, as shown in figure 2.

	A	B	C	D
8	\g	{BLANK count}		
9	loop	{stuff}{IF test}{QUIT}		
10		{BRANCH loop}		

Figure 2. You can create a looping macro with the {BRANCH} command. Here, the loop routine repeats until the value in *test* is not 0.

2. Don't forget to assign the name *loop* to cell B9. Now run the macro by pressing MACRO-G. This time, the macro runs *stuff* repeatedly until *var* contains a 5. As before, the number of times `\g` runs *stuff* is shown in *count*. Here's how it works:

`{BLANK count}` erases the contents of the cell named *count*.

`{stuff}{IF test}{QUIT}` calls the *stuff* routine, then checks whether the formula in *test* returns a 1 (true) or a 0 (false). If *test* returns a 0, macro processing stops.

`{BRANCH loop}` passes macro control back to the *loop* routine. If not for the conditional {QUIT} command in the previous line, the *loop* routine would run until you stopped it by holding down the Control key and pressing Break. In its current form, this macro runs until the value in *test* equals 5.

MORE-SOPHISTICATED LOOPS

The {BRANCH} command provides the simplest and probably most common form of looping you'll see in macro programming. But you should avoid using the {BRANCH} command. Its overuse results in sloppy and hard-to-manage macro code in spreadsheets, and you never really need it for looping routines. Use {BRANCH} loops only for quick-and-dirty solutions. For important applications, use some form of the {FOR} command.

The {FOR} command makes it especially easy to run a

	A	B	C	D	E	F
8	\g	{BLANK count}{FOR lcount,0,100,1,loop}				
9	lcount					
10	loop	{stuff}				

Figure 3. One of the best ways to set up a looping macro is by using the {FOR} command. Here, the macro executes the instructions in *loop* 100 times.

macro routine a preset number of times. For example, say you want to run the *stuff* routine exactly 100 times. Figure 3 shows how to modify the worksheet to do so. Enter the labels as shown in the current worksheet. Then use the Range Name Labels Right command to assign the labels in range A8..All as names for the adjacent cells in column B.

Run the modified macro by pressing MACRO-G. As you might expect, the {FOR} command runs the *stuff* routine 100 times. When the routine is completed, *var* contains some random integer. Note that the value in *lcount* is the same as the value in *count*.

Here's how the modified macro works:

`{BLANK count}{FOR lcount,0,100,1,loop}` erases the value in *count*, as before, but this time the macro starts a {FOR} loop. The {FOR} command takes five arguments: *counter*, *start_number*, *stop_number*, *step_number*, and *subroutine*. In this example, the command tells 1-2-3 to use the cell named *lcount* as a counter and to count by ones from 0 to 100 while running the subroutine *loop* once for each count. Because *loop* contains a call to *stuff*, *stuff* runs 100 times.

Running the *stuff* routine 100 times doesn't make sense for this application. Perhaps what you really want is to make 100 the *maximum* number of times the macro will run *stuff*. To do so, just change the *loop* routine as shown in figure 4. Press MACRO-G and the macro loops *stuff* 100 times or until the formula in *test* evaluates to 1 (true), whichever happens first.

	A	B	C
11	loop	{stuff}	
12		{IF test}{FORBREAK}	

Figure 4. You can stop a {FOR} loop in its tracks with the {FORBREAK} command. Here, the {FOR} loop is broken as soon as the value in *test* is not 0.

The added code in cell B12 changes the way the {FOR} loop works:

`{IF test}{FORBREAK}` stops the {FOR} loop if the formula in *test* evaluates to 1 (true). The {FORBREAK} command is better than the {QUIT} command. Once {FORBREAK} stops the {FOR} loop, macro processing continues after the {FOR} command. Here, that simply means processing a tilde (~). But because processing continues, the `\g` routine can be used by other routines that might call it and then go on processing. If the loop in `\g` were broken with a {QUIT} or a {BRANCH} command, that wouldn't be the case and your code would be less flexible.

LOOP A WHILE

If you want to create a loop that repeats indefinitely without using the {BRANCH} command, you need to use a little creativity. What you're looking for is sometimes

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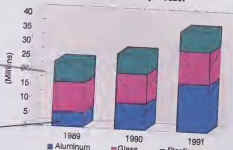
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The Materials Research Group Recommendation: FOCUS Aluminum

This study conducted by the Materials Research Group provides the basis for our next recommendation that WeCycle continue to expand its aluminum recycling capacity by another 70% over the next 6 years. The graph on the right shows the increasing proportion of our business provided by the aluminum division during the past three years, now representing half of all revenues. It is our opinion that, at this rate of growth, aluminum recycling will continue to offer our company its greatest opportunity for expansion over the next decade, and certainly into the 21st century.



Gross Revenues by Product



Glass and Plastics

As can be inferred from the graph to the left, glass and plastics recycling has been holding steady throughout this same period, and has consequently become a smaller proportion of our overall sources of revenue.

Although this group would strongly recommend that WeCycle Waste Corporation do all that is necessary to increase its activities in these areas, our studies have shown increasingly the material of choice is the shipping, heavy manufacturing and container industries.

Aluminum

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Therefore, we propose that WeCycle Waste Corporation invest in more aluminum capacity during the next five years in order to take the best advantage of this increasing market demand.

WE CYCLE PRODUCT		1989	1990	1991
Aluminum				
East		2,323,426	4,019,527	7,315,539
Central		1,372,347	2,374,160	4,320,972
West		1,726,462	2,966,831	5,436,033
Total		5,422,265	9,380,518	17,072,544
Glass				
East		2,496,721	2,567,821	2,798,925
Central		3,596,757	3,217,693	3,507,265
West		4,217,635	4,471,294	4,873,710
Total		10,311,113	10,256,808	11,179,920
Plastics				
East		2,897,493	3,171,243	3,234,666
Central		1,873,938	1,823,697	1,880,171
West		2,378,942	1,967,421	2,006,769
Total		7,150,373	6,962,361	7,101,606

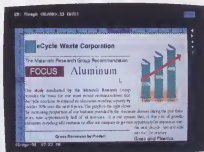
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- Text-editing for easy on-sheet word processing, including automatic word wrap, even around graphs
- The Auditor for documenting or highlighting your spreadsheet logic
- Improved memory management for building larger worksheets up to 12 MB in size
- New printer drivers that support all leading laser and dot-matrix printers
- Context-sensitive, interactive Help and an on-line tutorial

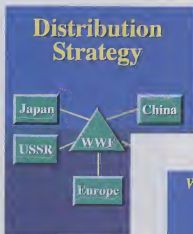
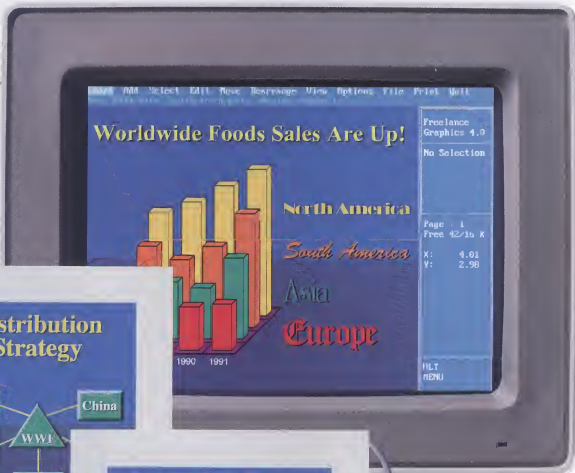
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The new Lotus 1-2-3 for DOS

Lotus

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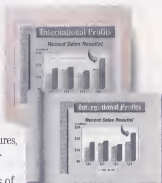
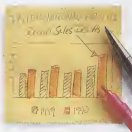
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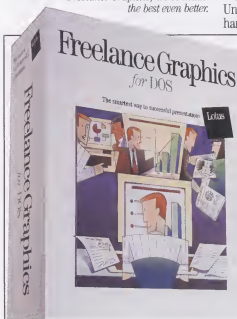
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*Developed by Spreadsheets Corporation, originally for *Freelance Graphics*. *2000 expires September 30, 1991, after which the Lotus direct upgrade price will be \$115. *Eligible products for upgrade offer exclude all versions of the following products: Lotus *Freelance Plus* or *Graphwriter*, *Harvard Graphics*, *Draw-Profit*, *Applicase II/Draw Applicase*, *Graph Pilot*, *Chartman*, *Microsoft Chart*, *Parus*, *Gen Series*, *ChartMaster*, *Diagram Master*. **Freelance Graphics* Upgrade also available at participating Lotus resellers.

Freelance Graphics for DOS

Lotus

	A	B	C	D	E	F
8	\g	(BLANK count){while test=0,stuff}"				
9						
10	wcount					
11	while	(DEFINE wcond,wcount)				
12		(LET wcond,"{(IF #NOT#"&wcond&")}{FORBREAK}")				
13		(LET wrout,"{("&wcount&")}"				
14		{FOR wcount,0,1,0,wcond}				
15						
16	wcond					
17	wcount					

Figure 5. 1-2-3 doesn't have a "while" command, but you can create the equivalent, as shown here.

called a "while" loop. 1-2-3 doesn't include a "while" command, but it has the tools you need to create a routine that works the same way. Figure 5 shows a macro named *while* that makes a great addition to any macro library.

If you want to keep the earlier exercise, save the current worksheet to a file called LOOP.WK1. Then erase range A10..B12 and select /Range Name Reset to clear all named ranges.

Modify cell B8 as shown and enter the rest of the labels. Use the Range Name Labels Right command to assign the labels in range A1..A17 as range names for the adjacent cells in column B. Run the macro by pressing MACRO-G. The \g macro runs the *stuff* routine repeatedly until the value in *var* equals 5.

This *while* routine is generic. You can use it just like a built-in macro command with the syntax {while *condition*,*routine*}. The *condition* argument can be any Boolean formula. The *routine* argument is the name of the macro routine you want to run repeatedly as long as the *condition* is true (not 0).

Here's how it works:

(BLANK count){while test=0,stuff} erases the contents of *count* and calls the *while* routine with two arguments. The first argument is the condition and the second argument is the macro routine (*stuff*) that runs as long as the condition is true.

(DEFINE wcond,wrout) enters the first argument from the call in *wcond* and the second argument in *wcount*. The macro enters both of these arguments as labels.

{LET wcond,"{(IF #NOT#"&wcond&")}{FORBREAK}"} changes the contents of *wcond* to a macro routine of the form {IF #NOT#*condition*}{FORBREAK}. This transformation lets the macro deal with hard-to-handle conditionals, such as @functions using range names. The macro also reverses the logic of the conditional from "while true continue" to the equivalent "when false stop."

{LET wrout,"{("&wcount&")}" changes the macro routine name in *wcount* to a routine call by enclosing the string in braces. Here, the macro changes the label *stuff* to {stuff}.

{FOR wcount,0,1,0,wcond} starts an infinite {FOR} loop. The {FOR} loop is infinite because the step argument, 0, adds nothing to the count. Therefore, the {FOR} loop never reaches the end argument, 1. This means that the *wcond* routine executes indefinitely. The routine {IF #NOT#*condition*}{FORBREAK} that the macro entered in {FOR} stops the loop when the condition is no longer true.

DO WHILE, DO WHILE

Sometimes you may want to execute a routine at least once, even if the condition is not true. For example, after you run the \g macro shown in figure 5 once, you have to erase the value in *var* before you can run it again. If you simply press MACRO-G without erasing the 5 in *var*, the macro never runs *stuff* because the condition, test=0, is already false.

A do-while loop runs a routine and then checks the condition to see whether it should run the routine again. Figure 6 shows such a macro. Enter the labels as shown and assign the range names. Then modify the \g routine as shown in figure 7.

Now you can run many trials by repeatedly pressing MACRO-G. Each time, the macro runs the *stuff* routine at least once. Here's how:

(DEFINE wcond,wrout) works as it does in the *while* routine.

{LET dwhile2,"{("&wcount&")}"&{"while "&wcond&","&wrout&"}"} writes a line of macro code in the cell named *dwhile2*. The *dwhile2* routine runs the macro loop and then calls the *while* routine. In this case, the macro enters the command {stuff}{while test=0,stuff} in *dwhile2*. The macro then processes that code. Save this file as WHILE.WK1. The *while* and *dwhile* routines run just fine in Hyperspace (the Macro Library Manager). Just be sure to save the whole range (A10..A21). ■

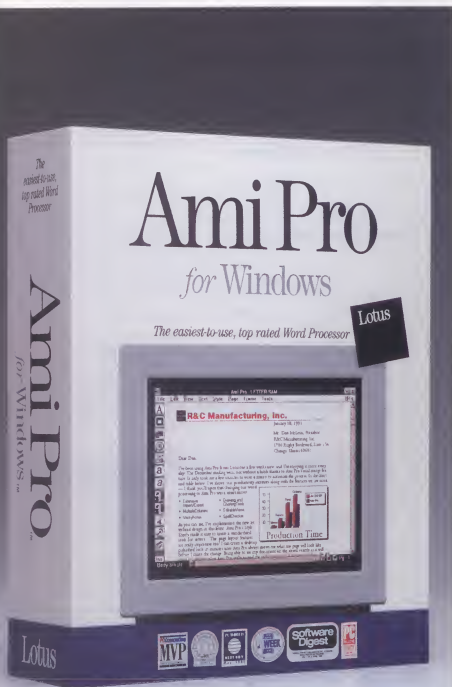
	A	B	C	D	E	F	G	H
19	dwhile	(DEFINE wcond,wrout)						
20		{LET dwhile2,"{("&wcount&")}"&{"while "&wcond&","&wrout&"}"}"						
21	dwhile2							

Figure 6. By building on the *while* routine shown in figure 5, you can easily create the equivalent of a "do-while" command.

	A	B	C	D	E	F
8	\g	(BLANK count){dwhile test=0,stuff}"				

Figure 7. Modify the \g routine from figure 5 as shown here.

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**SPECIAL
REPORT**

**LOTUS GOES
GRAPHICAL**

1-2-3 FOR WINDOWS: THE REAL McCoy

At long last, Lotus does Windows right.

BY JUSTIN FIELDING

Now you can really have *Microsoft Windows* and *Lotus 1-2-3*, too. *1-2-3 for Windows*, scheduled for a summer release, makes the familiar Lotus spreadsheet a full citizen in the world of *Microsoft Windows* 3.0. What's more, it's macro-, file-, and keystroke-compatible with earlier releases of *1-2-3*.

Unlike earlier releases that ran under *Windows* without embracing it, *1-2-3 for Windows* fully supports all of *Windows*' shortcuts for basic tasks while at the same time exploiting the *Windows* environment to deliver superior graphics, printing, memory-management, and data import and export capabilities.

Many of the graphical features of *1-2-3 for Windows* are akin to those of the WYSIWYG add-in that comes with Releases 2.3, 3.1, and 3.1+, but they're adapted to the look and feel of *Windows*' graphical user interface (GUI).

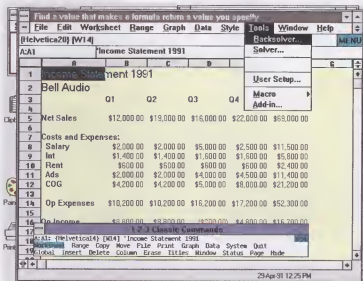
The Solver and Backsolver goal-seeking technologies that debuted in *1-2-3/G* running under the OS/2 operating system are also integrated into *1-2-3 for Windows*. And *1-2-3 for Windows* simplifies and enhances the features of its character-based cousins. Spreadsheet publishing, 3-D spreadsheets, multi-file applications, external database access, and macro recording are all more accessible in *1-2-3 for Windows*. The SmartIcons feature in *1-2-3 for Windows*, meanwhile, is pure *Windows*. This innovation lets you create a custom environment for building and using spreadsheets. You can choose from a selection of icons to build a custom palette of graphical commands that speeds up the tasks

you perform most often. You can even design your own icons that launch your favorite macros with a click of the mouse.

More important to most users, *1-2-3 for Windows*' new look and novel features do not come at the expense of compatibility with other releases. It uses the same file formats—WK3 and FM3—as *1-2-3* Release 3.x, and it easily trades files with other versions of *1-2-3*, as well as with all releases of *Symphony*.

A TALE OF TWO MENUS

Even better, dual menu systems let you use your fingertip knowledge of standard *1-2-3* commands or your point-and-click experience with *Windows*. The *1-2-3* Classic menu faithfully



1-2-3 for Windows gives you two menu systems. The 1-2-3 Classic menu, with its familiar commands, pops up at the press of the slash key. The GUI menu system is pure *Windows*.

observes *1-2-3* conventions, while the GUI menu system is unadulterated *Windows*. You can use either menu at any time—whichever one you find more comfortable or more convenient for the command you want to execute.

At least at first, *1-2-3* veterans may prefer the *1-2-3* Classic menu, with its familiar commands, which pops up at the press of the slash (/) key. If you're handy with the WYSIWYG add-in, you can type a colon to perform spreadsheet-publishing operations using the commands you already know. All the familiar navigation keys get you around the worksheet, and almost all the function keys behave as they do in Releases 2.x and 3.x. Your existing macros, even ones that issue menu commands, will run without a hitch—and without conversion.

Experienced *Windows* users will probably opt for the GUI menu system. The GUI menus are standard *Windows* menus: They stay on-screen at all times, they're accessible via Alt-key combinations or a mouse, and they include all of the conventional *Windows* commands for such tasks as cutting, pasting, printing, and exiting.

RING IN THE NEW

Only the GUI menus support the program's new features. The GUI menu bar displays the following menus: File, Edit, Worksheet, Range, Graph, Data, Style, Tools, Window, and Help. When you work on a graph, the Worksheet, Range, Graph, and Data menus are replaced by Chart, Draw, Layout, and Rearrange.

1-2-3 diehards should keep in mind that the GUI menus err on the side of *Windows* standards. For example, you won't find an Erase command under the GUI Range menu, because it would duplicate the Edit menu's Clear command. The ability to select cells either before or during commands was borrowed from *1-2-3/G*. In most graphical software, you have to cancel a command if you forget to select the data first, or if you select the wrong data. In *1-2-3 for Windows*, you can specify or respect

the cells without quitting the command.

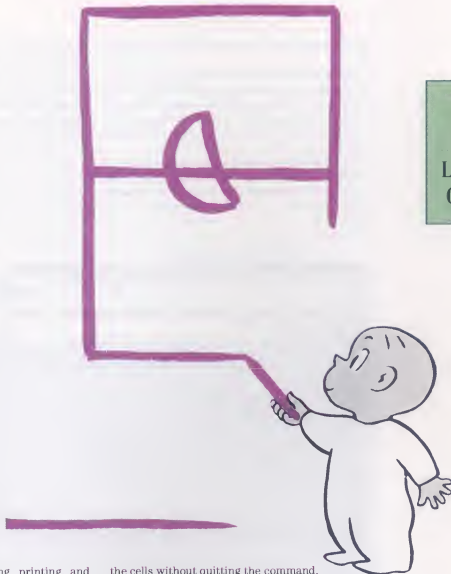
Like the Toolbar in *Microsoft Excel 3.0*, *1-2-3 for Windows*' SmartIcons palette contains a set of icons that you can click on to perform common spreadsheet tasks. But unlike *Excel*'s Toolbar, SmartIcons let you alter the default group of icons. You can add and subtract icons from a large assortment of built-in tasks, or create your own icons to launch macros. You can, in fact, create libraries of different groups of icons and switch among them, using the palette best suited to the task at hand, whether it's revising a spreadsheet, creating a graph, or building an application. You can also change the shape and size of the icon palette and move it anywhere on the screen.

MACRO COMMANDS AND MORE

The ability to launch macros from the SmartIcons palette is merely the flashiest of *1-2-3 for Windows*' programming features. It's bolstered by an improved way to record macros and by a new set

SPECIAL REPORT

LOTUS GOES GRAPHICAL



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SPECIAL REPORT

LOTUS GOES GRAPHICAL

of macro commands. It also sports a new MACRO key.

Although existing *1-2-3* macros work fine in *1-2-3 for Windows*, you invoke them with the Control key rather than the Alt key. (*Windows* reserves the Alt key for menu shortcuts.) As in *1-2-3* Releases 2.2 and higher, you can also start macros by pressing the RUN key (Alt-F3).

1-2-3 for Windows' Transcript window makes it easier than ever to record commands and copy them into a macro. It keeps a record of the most recent keystrokes and mouse actions—up to 512 characters' worth. After viewing them in the Transcript window, you can use Copy and Paste

text or graphical data from one place and then paste it somewhere else—even into another application. *1-2-3 for Windows* adds its own Edit Quick Copy and Edit Move. These resemble, respectively, the Copy and Move commands on the *1-2-3* Classic menu. They let you duplicate or relocate cells via a single command, and they do not use the Clipboard.

1-2-3 for Windows' Edit Paste Link and Edit Link Options commands take the copy-and-paste concept even further by exploiting *Windows'* Dynamic Data Exchange (DDE) feature. DDE can link *1-2-3 for Windows* with other applications so that when you change the data in one file, it automatically updates the other files.

For retrieving information from external databases, however, Lotus's DataLens technology, which first appeared in *1-2-3* Release 3, is faster than DDE. Implemented via the Data External commands, DataLens lets you treat an external database as if it were a *1-2-3* database. *1-2-3 for Windows* puts a graphical face on the Data External commands and includes drivers for *Paradox*, *SQL Server*, and *dBase III and IV*.

Eventually, says product manager Paul Stroube, *1-2-3 for Windows* will incorporate the Object Linking and Embedding (OLE) specification. On its way to becoming an industry standard, a preliminary version of OLE is already part of such products as *Lotus Notes*, *Excel*

3.0, and *Microsoft PowerPoint* and will be incorporated into Lotus's forthcoming *Ami Pro 2.0*.

OLE extends DDE to let you create compound documents by "embedding" data from one application—say, a graph—within a file in another. Once a graph is embedded in a *Notes* document, for example, OLE lets you double-click on the graph to automatically launch the originating program and load the relevant file. Dynamic linking keeps the document current with any changes to the original.

MORE POWER TO YOU

The Backsolver and Solver technologies built into *1-2-3 for Windows* help you use linear and nonlinear mathematics to solve optimization and other "what-if" problems. *1-2-3 for Windows* uses fill-in-the-blanks dialog boxes to make it easy to

	Q1	Q2	Q3	Q4	YTD
Net Sales	\$12,000.00	\$19,000.00	\$16,000.00	\$22,000.00	\$69,000.00
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Int	\$500.00	\$1,400.00	\$1,600.00	\$1,600.00	\$5,100.00
Rent	\$500.00	\$500.00	\$500.00	\$500.00	\$2,000.00
Ads	\$900.00	\$2,000.00	\$4,000.00		
COG	\$4,000.00	\$4,200.00	\$5,000.00		
Op Exp	\$3,700.00	\$10,200.00	\$16,200.00		
Op Income	\$3,300.00	\$8,800.00	\$2,000.00		

With *1-2-3 for Windows'* customizable SmartIcons, you can choose a set of icons to speed up the tasks you perform most often. You can even design your own icons and attach macros to them.

commands to place selected keystrokes into a worksheet.

A host of new macro commands controls the functionality that the program derives from *Windows*. Menu commands that start with a slash, a colon, or (MENU) call up the *1-2-3* Classic menu, while the new macro key words {ALT}, {MENUBAR}, and {MB} give macros access to the GUI menus. Other commands such as {EDIT-COPY} and {LINKCREATE} supervise various means of exchanging data between applications in the *Windows* environment. A few new macro commands aren't directly related to *Windows*. {COMMIT} and {ROLLBACK} execute or cancel transactions made against an external database file, and {FILE-ERASE} simplifies the task of erasing disk-based files.

The *Windows* Clipboard lets you use Edit Copy, Edit Cut, and Edit Paste commands to copy or cut

specify which cells should change to reach a desired result.

Of course, DOS-based *Windows* can't match OS/2's multithreading capabilities. So unlike their counterparts in *1-2-3/G*, *Solver* and *Backsolver* in *1-2-3 for Windows* cannot work their magic unobtrusively in the background, which means that you can't continue to work in your spreadsheet until the calculations are complete.

WINDOWS, WINDOWS, EVERYWHERE

Not only is the *1-2-3 for Windows* application itself a window, but each open worksheet and graphs displayed via the Graph New and Graph View commands appear in a window within the *1-2-3 for Windows* workspace. *1-2-3 for Windows'* Transcript, Help, and Print Preview features, as

well as the *1-2-3 Classic* menus, are all displayed in windows, too.

The Perspective feature displays three sheets of a 3-D worksheet in one window. An icon on the worksheet lets you move among the sheets. Icons at the top-right and bottom-left corners of a worksheet window let you break up the window into "panes."

You can minimize most *Windows* applications: The application stays open, but it shrinks down to an icon. *1-2-3 for Windows* takes this capability a step further and lets you do the same thing to an open worksheet or graph.

GRAPHICAL GRAPHS

As you'd expect from a GUI spreadsheet, *1-2-3 for Windows* makes graphing more convenient than ever. The underlying concepts of *1-2-3* and

SPECIAL REPORT

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WHAT IS MICROSOFT WINDOWS?

Microsoft *Windows 3.0* is a software system that extends the capability of the DOS operating system with a graphical user interface (GUI) along the lines of the Apple Macintosh computer.

A GUI is based on pictures, or icons, and on a standard menu structure. All *Windows* applications operate in much the same way, and the icons make it easy to figure out how to perform new tasks. In a GUI system, a mouse is often the simplest way to select icons, commands, and data. *Windows*, however, also lets you perform most operations via the keyboard.

The minimum hardware requirements for *Windows* can be misleading. Theoretically, *Windows* will run on virtually any IBM-compatible PC, but it's impossibly slow on XT-class machines, which are based on the Intel 8088 and 8086 chips. *Windows* performs considerably better on 80286-based computers but can still be frustratingly sluggish in many operations. To run *Windows* effectively, you'll want a PC based on the Intel '386 or '486 chip. The lower-priced '386 SX performs adequately for most applications, but '386 DX and '486 systems are considered ideal *Windows* machines.

Windows also requires ample RAM: at least 2 megabytes and ideally 4 megabytes or more. You also need a hard disk with 20 megabytes or more—preferably much more—of available space. *Windows* puts these resources to good use. It lets programs access more memory than DOS typically allows, and it employs a technique called virtual memory that treats available

hard-disk space as additional RAM.

It also lets you run several programs at once, each residing in a window—a separate section of the screen. Likewise, each of several documents in use by an application can reside in its own window. If you want to keep an application running but you don't want its window cluttering the screen, you can reduce it to an icon at the bottom of the screen.

Windows utilities include the Program Manager and File Manager, which provide ways to locate and organize files and to run applications; the Print Manager, which allows you to keep working while you print; and the Control Panel, which lets you customize the environment.

Windows offers its biggest payoff for people who use more than one application. Many of the techniques you develop using one *Windows* application will also work in most other *Windows* applications. You can exchange data among *Windows* programs through the Clipboard and Dynamic Data Exchange features.

Since Microsoft has shipped over 3 million copies in the year following the release of *Windows 3.0*, it's not surprising that virtually every major software vendor, along with scores of entrepreneurial developers, has either shipped or announced *Windows* applications. With the imminent arrival of *Windows* versions of popular DOS applications such as *1-2-3* and *WordPerfect*, it's becoming easier for businesspeople to outfit their machines with a full suite of *Windows* applications—applications that work alike and work together. —J. F.

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WYSIWYG graphics techniques still apply, but SmartIcons and a more straightforward menu structure make jazzing up your graphics easier and more fun.

When you issue the Graph New or Graph View command, *1-2-3 for Windows* presents a window that displays the worksheet data in graphical form. You can change any of the basic graph settings from this window.

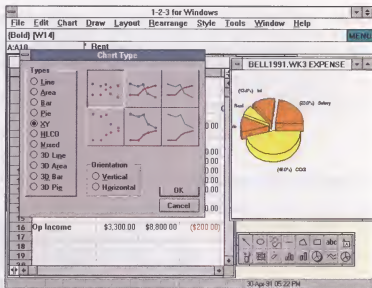
A gallery of graph types offers several variations on each chart type, including 3-D options. For example, if you choose Chart Type and select Bar, *1-2-3 for Windows* displays pictures of common bar-graph types, and you can use the mouse or keyboard to pick the one you want.

The fun begins when you place the graph into the worksheet. You can use *1-2-3 for Windows'* Draw commands to enhance it much as you would with WYSIWYG. You can add arrows, polygons, and freehand drawings to your graph, you can even paste in images from the Clipboard, as long as they're in the *Windows* metafile or bitmap format. You can also import PIC and CGM files from disk and place them on the worksheet. If you want to put graphic elements—but not a graph—into the worksheet, you can insert a blank graph and then draw at will.

READ THE FINE PRINT

Windows was designed to relieve many printing headaches. For example, instead of separate printer drivers for each application, *Windows* provides drivers that work with all *Windows* applications. On the other hand, its handling of fonts is less than ideal. For this reason, many *Windows* users purchase add-on "scalable-font" software, such as the popular Adobe Type Manager. People who buy *1-2-3 for Windows* won't have to worry about this, because scalable-font technology is included. *1-2-3 for Windows'* GUI menus follow all the *Windows* printing conventions. The print commands on the File menu let you preview the printout on-screen, select a number of printer and page-layout settings, and of course, print. *1-2-3 for Windows* also supports *Windows'* Print Manager, which facilitates background printing, so you can work while your printer does.

In the graphical *Windows* environment, you don't need to send complex setup strings to control



The Graph Gallery lets you select from several variations on each chart type—including 3-D options. You can use the mouse or keyboard to pick the one you want.

printing. However, *1-2-3 for Windows* comes with a printer driver that can handle existing worksheets that depend on these strings.

THE HELP WINDOW

Windows provides excellent tools for on-line help, and *1-2-3 for Windows* uses them to the hilt. *1-2-3 for Windows* help appears in a separate, sizable window, and it provides exhaustive information about virtually every aspect of the software.

To locate the help you need, choose a topic from the Index, use the Browse buttons, or select Search and enter a key word. Jump to a related topic by clicking the mouse on any highlighted item in a help screen. You can retrace your steps at any time by clicking on the Back button. And you can keep the Help window handy while you continue to work. Once you find the information you need, you have several options: You can print it; copy and paste it into a spreadsheet or document; insert a "bookmark" that helps you return to the topic; or add your own comments.

Despite all the new features, the best part of *1-2-3 for Windows* for *1-2-3* veterans is that getting up and running in it will take practically no time at all. Compatibility with previous *1-2-3* releases has long been Lotus's trump card, and with *1-2-3 for Windows'* dual menu systems, the product designers have played it well. ■

Justin Fielding, LOTUS's senior techniques editor, is the author of *The Lotus Guide to 1-2-3 for Windows*, to be published this summer by Brady Books in association with Lotus Publishing Corp.

1-2-3 FOR MACINTOSH

Lotus covers a third GUI base with a spreadsheet for the computer that started the graphical revolution.

BY KELLY R. CONATSER

Lotus Development Corp. is making a full assault in the GUI theater of operating systems. To round out its entries in the graphical-user-interface field—*1-2-3 for Windows* and *1-2-3/G* for OS/2—Lotus will release a version of *1-2-3* for the Apple Macintosh in late summer or early fall.

1-2-3 for Macintosh is "a design triumph," according to Jeffrey Tarter, editor of the industry newsletter *Softletter*, in Watertown, Mass. Because the Macintosh operating system has a technical edge over DOS-bound *Windows*, *1-2-3 for Macintosh* pushes the graphical spreadsheet interface far beyond icons and scroll bars. Plus, the new program is file- and keystroke-compatible with its character-based cousins.

Consider the advantages offered by the Mac's user interface: You can display nine worksheets in 3-D perspective, not just three. You can place a specially marked icon, or "button," to activate a macro directly on your worksheet, where no one can overlook it. You can size, position, and display several custom views of one or more worksheets on

your screen, a marked improvement over the windowing features offered by other releases of *1-2-3*. Double-clicking on an entry gives you in-cell editing, so you don't have to divert your attention to the edit box after placing the cell in Edit mode. If the edit box at the top of the worksheet is cluttering your view, you can remove it from the display and do all your editing in the worksheet.

More important, you can access *1-2-3 for Macintosh's* Draw layer at any time to create and manipulate text, graphs, pictures, geometric shapes, and buttons directly in the worksheet. You don't have to partition a specific area of the worksheet in advance, as you do in *1-2-3 for Windows* and *1-2-3 Release 3.x*.

Spreadsheet graphics has traditionally been one of the Mac's strongest selling points and one of *1-2-3's* weakest. *1-2-3 for Macintosh* comes with a graph palette that lets you select any element of a graph, such as a title or a bar from a bar chart, and change its color, style, or fill pattern. You can also size the graph, rotate it, elevate it, and change the direction of lighting and shadow effects. The

Graph Gallery offers a dozen selections, including bar charts and pie charts in 3-D.

There's more, of course. Unobtrusive icons in the corner of the spreadsheet execute the Range Name command or put all the spreadsheet @functions at your fingertips. Tear-off menus let you optimize your work environment, and the New Form command lets you create a customized display form for both worksheet and external databases. Best of all, *1-2-3 for Macintosh* offers this powerful, pliable interface while maintaining what Tarter calls "the spartan feel that people like about the original *1-2-3* spreadsheet."

To help preserve that spartan feel, *1-2-3 for Macintosh* offers

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GRAPHICAL

	Q1	Q2	Q3	Q4	Total
Atlanta	\$50	\$59	\$42	\$39	\$221
Boston	\$75	\$58	\$114	\$83	\$327
Chicago	\$64	\$47	\$37	\$112	\$260
Dallas	\$84	\$67	\$41	\$85	\$277
Total	\$262	\$231	\$234	\$319	\$1,046

	Q1	Q2	Q3	Q4	Total
Atlanta	\$55	\$85	\$95	\$105	\$340
Boston	\$50	\$102	\$95	\$70	\$317
Chicago	\$80	\$70	\$85	\$90	\$325
Dallas	\$102	\$77	\$57	\$87	\$323
Total	\$347	\$334	\$322	\$352	\$1,355

	Q1	Q2	Q3	Q4	Total
Atlanta	\$322	\$276	\$262	\$275	\$1,135
Boston	\$322	\$291	\$335	\$261	\$1,209
Chicago	\$261	\$226	\$222	\$338	\$1,047

The Mac's user interface lets you display nine worksheets in 3-D perspective. (Note: Screens were captured from prerelease software and may differ slightly from their final form.)

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the 1-2-3 Classic menu system, which should smooth the path for 1-2-3 users migrating from a DOS platform. This innovation, which is also available in 1-2-3 for Windows, lets you pop up the 1-2-3 menu by pressing the slash key, and then keystroke your way through 1-2-3 commands.

Because the Macintosh's WK3+ file format is a superset of the WK3 format in 1-2-3 for Windows and 1-2-3 Release 3.x, you can use files created with other versions of 1-2-3. You can also read in files from all current Macintosh releases of *Microsoft Excel* by using the File Open command. Translation occurs automatically in the background.

In a nutshell, 1-2-3 for Macintosh offers users nearly the same worksheet functionality as 1-2-3 for Windows but with superior graphical tools. It lacks two of 1-2-3 for Windows' big guns, however. The more important is Solver, 1-2-3/G's linear-programming utility that's now part of 1-2-3 for Windows and 1-2-3 Release 3.1+. (1-2-3 for Macintosh does offer Backsolver, a simpler problem-solving utility borrowed from 1-2-3/G.) The other missing piece is 1-2-3 for Windows' handy SmartIcons feature, a customizable palette of commonly used tools that you can position anywhere in the worksheet or remove from the display.

Just about the only other thing that 1-2-3 for Macintosh doesn't offer is a Macintosh, and therein lies the rub for many potential corporate converts. "The thing that's restricting the Mac market is hardware pricing," says Marshall Moseley, a software analyst at Dataquest, a market research firm in San Jose, Calif. "Windows is not as good a GUI—it's really not even close—but Apple's pricing pushes things to an equitable point."

In hopes of tilting the balance back in its favor and regaining some of its slipping market share, Apple Computer recently slashed prices on many

Mac models. The company hopes that 1-2-3 for Macintosh, along with lower hardware prices, will give the Macintosh a needed boost in the corporate market. "When [the platform supports] products like 1-2-3, there's no way to consider this a niche machine," observes David Kulbarsh, a manager with Apple's Business Markets Group.

READY FOR SYSTEM 7

Apple has bent over backward to make interfaces between applications as simple as possible. System 7, the updated Mac system software due to be released in May, includes Publish and Subscribe, a clearinghouse for data exchange between applications, similar to Windows' Dynamic Data Exchange facility. Unlike DDE, however, Publish and Subscribe doesn't require carefully coded cooperation between two applications. When you want to import spreadsheet data into a word-processing application, you don't have to worry about whether the two have been formally introduced with built-in protocols.

Communication with outside databases, including mainframe databases, is also easier than with DOS-based versions of 1-2-3. The Data Access Language included with both System 6 and System 7 acts as a flexible driver for many databases, including Oracle, Sybase, and DB2, taking a good deal of the burden off 1-2-3's DataLens drivers. The Data External command, a cryptic torture test for Release 3.x users, is humanized in 1-2-3 for Macintosh with a series of dialog boxes.

But even with 1-2-3 file and keystroke compatibility and better communication with other machines ranging from Macs to mainframes, analyst Moseley points out that Apple has not yet slain the compatibility hydra, which has reared another ugly head: the local area network. The maverick who buys a Mac for the office may find that it doesn't fit in with the company's DOS-based LAN. Most PC users who have endured DOS-based networking probably wouldn't mind trying something else, but the existing investment in hardware makes a wholesale switch unlikely.

It's not clear how much 1-2-3 for Macintosh will help Apple win over corporate management, but fur will fly within the existing Mac market as 1-2-3 for Macintosh goes up against Excel. ■

	Q1	Q2	Q3	Q4	TOTAL
Atlanta	\$222	\$276	\$282	\$275	\$1,135
Boston	\$222	\$251	\$335	\$261	\$1,209
Chicago	\$251	\$225	\$232	\$336	\$1,044
Dallas	\$337	\$229	\$220	\$257	\$1,043
Total	\$1,242	\$1,052	\$1,020	\$1,171	\$4,485

Like 1-2-3 for Windows, 1-2-3 for Macintosh gives you two menu systems: one that's sheer 1-2-3 and another that's absolutely Macintosh.

Kelly R. Conatser is contributing editor to LOTUS and author of *The Lotus Guide to 1-2-3 for the Macintosh*, forthcoming from Brady Books in association with Lotus Publishing Corp.

LOTUS LINKS ITS WINDOWS PROGRAMS

Ami Pro, Freelance Graphics, Notes, and cc:Mail to share features and interface.

SPECIAL
REPORT

LOTUS GOES
GRAPHICAL

BY JENNIFER J. SMITH

Lotus calls it "Working Together." Microsoft calls it "Information at Your Fingertips." What it means is a long-term product strategy to closely link spreadsheet, word-processing, graphics, and other programs into extended families of interconnected applications. Family traits will include simplicity of operation and a common user interface.

"We're going to take the idea of application integration and build on it," says Alex Morrow, systems manager of application integration at Lotus Development Corp.

Lotus will concentrate first on tying together its Windows applications: 1-2-3 for Windows, Ami Pro, Freelance Graphics for Windows, and Lotus Notes.

AMI PRO

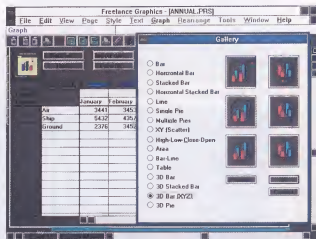
The most mature product in Lotus's Windows suite is the 3-year-old Ami Pro, the award-winning word processor Lotus acquired with its purchase of Sanna Corp. last fall. The third major upgrade, Ami Pro 2.0, is slated for release next month. Lotus is playing its cards close to its corporate vest, but the upgrade reportedly will include improved text-handling features—an outliner, support for mathematical and scientific equations, and some group-editing facilities.

It will also have close ties to other Lotus Windows applications. Ami Pro 2.0 and 1-2-3 for Windows "will be very easy to use together" and will have "a strong family resemblance," says Said Mohammadioun, vice president, Lotus Word Processing Division. Over time, Lotus is expected to blend the best features of each program into a common user interface. For example, the SmartIcons feature in both 1-2-3 for Windows and Freelance Graphics for Windows originated in Ami Pro as the customizable Icon Bar.

Cross-product support for data formats and a single scripting language will follow, according to Mohammadioun. Support for data formats has

begun already: New Windows Clipboard formats let 1-2-3 for Windows and Freelance Graphics for Windows, for example, trade data complete with formulas and attributes.

Ami Pro 2.0 will achieve some, but not all, of the long-term goals, says Mohammadioun. Like Lotus Notes and Freelance Graphics for Windows, Ami Pro 2.0 will support the Object Linking and Embedding (OLE) extension to Dynamic Data Exchange (DDE), which will also be shared eventually by 1-2-3 for Windows. "Each subsequent release will pull it together tighter," Mohammadioun says.



The Graph Gallery (right) lets you choose from a menu of sample charts. At the top left, you can see part of the SmartIcons palette, which lets you automate common printing, filing, and graphics tasks.

FREELANCE GRAPHICS FOR WINDOWS

Freelance Graphics for Windows, slated for a fall debut, is based on Freelance Graphics for OS/2 but includes new bells and some Windows whistles—including special links to 1-2-3 for Windows. In addition to enhanced drawing and charting capa-

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bilities and presentation-management features, the program incorporates an integrated outline and a fully compliant *Windows* interface that offers SmartIcons, a customizable set of icons, says Betsy Fortin, product manager for *Freelance Graphics for Windows*.

Freelance's SmartIcons feature will provide a movable, resizable palette of more than three dozen icons that speed up common tasks. By assembling a palette of the printing, filing, and graphics tasks you perform most often, you can create a custom environment for building presentations.

Freelance Graphics for Windows will be two-way file-compatible with all *Freelance* versions and will also support the *Windows* Clipboard, DDE, and OLE. New, proprietary Clipboard formats will let you bring live, editable 1-2-3 for *Windows* charts into *Freelance Graphics for Windows* rather than uneditable pictures of charts. For spreadsheet data created in DOS versions of 1-2-3, *Freelance Graphics for Windows*' disk-based file-linking feature lets you view worksheet files from within the program, grab worksheet ranges, and establish links.

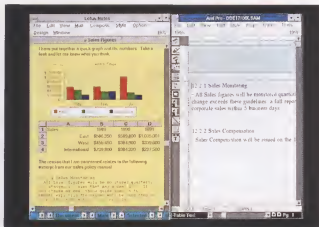
A new, integrated outline helps out with text charts. When you use it to create a text outline and then switch to presentation pages, the outline text is automatically sized, wrapped, and laid out on a page. You can create other types of charts quickly by selecting them from the Graph Gallery, a menu of sample charts. A "smart" chart-composition capability checks for appropriate layout and aspect ratio and automatically scales text, labels, legends, and other elements to achieve overall balance.

NOTES/CC:MAIL

In many ways, *Notes* most closely resembles what Lotus's *Morrow* has in mind when he says that the real application-integration story is "letting people work with tools they already understand but with new types of data."

Notes 2.0, the latest version of Lotus's groundbreaking group-communications software, was the first Lotus product to support OLE. It also offers a new interface, better graphics handling, E-mail enhancements, simpler remote access, quicker replication, and DDE support.

Notes is already helping people work with new types of data. For example, with a *Notes* add-on called *Remark!* from Simpact Inc., users can embed voice annotations within *Notes* documents. And Lotus and Eastman Kodak Co. are working on a



An Ami Pro document (right) is dynamically linked to a Notes form (left) so that any change made in Ami is updated in Notes.

system that captures and integrates hard-copy documents and images into *Notes* applications.

Notes' future includes a Macintosh version, about a year away, according to Eric Sall, director of product management for *Notes*. A Unix version is also part of the *Notes* strategy, he says, along with improved text-retrieval capabilities and network-management features.

The big *Notes* news is Lotus's recent acquisition of *cc:Mail*, the popular E-mail program. The recently shipped *Windows* version joins the DOS, OS/2, and Apple Macintosh versions, allowing users on multivendor LANs to exchange text, graphics, and binary files, as well as fax messages. At the moment, however, the *Windows* version supports neither DDE nor OLE. "DDE will come before the end of the year," says Shelly Harrison, director of marketing for Lotus's *cc:Mail* division. *cc:Mail* will also get an OLE link, she says, but the timetable isn't as firm.

Over this year and next, Lotus will implement a multistage plan to integrate *cc:Mail* and *Notes*. Lotus plans first to enhance the current gateway through which *cc:Mail* and *Notes* users can exchange messages with file attachments, says Sall.

Stage 2 involves synchronizing *cc:Mail's* and *Notes'* user directories so that changes to one are updated in the other, simplifying the administration of dual mail systems. Stage 3 consists of a single, common directory that both *Notes* and *cc:Mail* can talk to, along with a set of common application programming interfaces that will allow developers to write programs that can send files through the *Notes/cc:Mail* system complete with all their attributes.

And of course, adds Sall, *Notes* and *cc:Mail* will share ongoing gateway development. "People expect you to connect to everything." ■

MANAGING WINDOWS ANXIETY

Combining 1-2-3 and Windows presents tough choices for corporate leaders.

SPECIAL
REPORT

LOTUS GOES
GRAPHICAL

BY CLINTON WILDER

At United Technologies Corp.'s headquarters, personal-computer users feel caught between a rock and a hard place. The rock is *1-2-3*, a firmly established computing standard. The hard place is *Microsoft Windows* 3.0, which is rapidly emerging as the operating environment of choice for the 1990s.

In United Technologies' main offices in Hartford, Conn., about 400 people are running *1-2-3* Releases 2.2 and 3.1 under *Windows*. Many are anxious to take full advantage of the graphical interface shared by all *Windows* applications and to further demolish DOS's 640K memory limitations. Down the road, Dynamic Data Exchange (DDE)—the ability to automatically trade and update information among several *Windows* applications—looms as perhaps the most important benefit.

Until *1-2-3 for Windows* (see "1-2-3 for Windows: The Real McCoy" in this issue) arrives later this summer, however, *1-2-3* offers little of this kind of functionality, leaving United Technologies and many other users squeezed in the middle. Companies want *Windows*, but they don't want to give up their familiar spreadsheet.

Like most *1-2-3* shops, United Technologies remains committed to Lotus spreadsheets. "We have a lot of divisions that use *1-2-3* around the world," says Veronica Morton, office-systems project analyst at the manufacturing conglomerate's headquarters. "It's not wise on our part to move to a non-Lotus platform. But customers aren't that easy to hold back." Some *Windows* users are willing to wait, she says, but others are telling their office-systems managers that they want to switch to a true *Windows* spreadsheet, now.

Some DOS-based *1-2-3* operations are merely holding off implementing *Windows* until *1-2-3 for Windows* comes out. Other companies don't have that luxury; *Windows* has already become their stan-

dard PC environment. These companies are struggling over which spreadsheet to use.

Still others have hitched their wagons to the OS/2 operating system, which promises many of the benefits of *Windows*, plus more. *1-2-3/G*, Lotus's graphical spreadsheet for OS/2, has been out since March of last year, but acceptance of OS/2 has been slowed by a relative lack of application software and a popular perception that it is undependable and hard to learn.

Given the overwhelming early success of *Windows*—about 3 million copies sold and new applications appearing weekly—*1-2-3* shops face five basic options for dealing with the new operating environment.

1 Ignore *Windows* and stay with DOS and traditional character-based applications, including *1-2-3*. Despite the expense of the additional hardware, training, and support involved in con-



Veronica Morton of United Technologies must convince hundreds of *Windows* users to stick with 1-2-3 Release 3.1 until 1-2-3 for *Windows* arrives.

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verting to *Windows*, few companies seem to favor this option. Even without a clear sense of the benefits *Windows* offers them, many managers seem convinced that the future of personal computing does not lie in character-based DOS applications, and they don't want to get left behind.

2 Stay with a character-based PC environment for now, and when the switch comes, jump directly to *1-2-3 for Windows*. Companies taking this tack say that *Windows* still needs to stabilize, especially in the areas of networking, printing, and memory management, and they want to minimize the training and support costs involved in switching applications along with operating environments. Some are waiting for the next *Windows* update, rumored to be shipping late this year, which will presumably address some of these issues. While they wait, many companies are conducting limited *Windows* pilots to keep up with the technology.

3 Go to *Windows* but stay with current releases of *1-2-3*, at least for a while. Release 3.1 works well under *Windows*, though it doesn't support all of the environment's advantages. Despite the frustration, this may be the most popular option, at least until *1-2-3 for Windows* ships.

4 Ignore *Windows* in favor of OS/2 with Presentation Manager. Although only a few companies seem to be adopting OS/2 right now, sticking to a previously hatched OS/2 strategy maintains a consistent PC environment while still delivering the benefits of a graphical user interface and better multitasking. Besides, *1-2-3/G* is already available. But the success of *Windows* means that even users in OS/2 shops may push for the *Windows* environment instead.

5 Switch to *Windows* and replace *1-2-3* with a *Windows* spreadsheet, such as Microsoft's *Excel 3.0*. Abandoning *1-2-3*, however, means abandoning a long-standing investment in the program.

AWAITING 1-2-3 FOR WINDOWS

Dale Mallek, director of information services at the Phoenix law firm of Meyer, Hendricks, Victor, Osborn & Maledon, likes the promise of *Windows* but wants to avoid disrupting the firm's 75 users of *1-2-3*. He wants to keep everybody satisfied and hold downtime to a minimum.

"I feel as if we're back in the early 1980s, except it's even more difficult," Mallek says. "In the early days of the PC, users didn't have high expectations. Just using *1-2-3* at all was considered miraculous.

Now they want to do a lot more."

So does Mallek. In addition to accounting employees, attorneys handling high-profile corporate mergers or bankruptcies are some of the firm's biggest *1-2-3* users. Employees mainly use Release 2.2, but there is an ongoing migration to Release 3.1 independent of the firm's plans for *Windows*. The firm gets some text-based windowing functionality by running the spreadsheets in Quarterdeck Office Systems' *Desqview* environment.

To smooth the transition to *Windows*, Mallek is getting familiar with it on his PC at home and plans to start a pilot for the firm's 20 to 25 most experienced users by the end of the year. He hopes for a full migration by mid-1992. When the firm is ready for *Windows*, it will go directly to *1-2-3 for Windows*.

Concern over the migration itself—not the short-term lack of a *Windows*-specific *1-2-3* release—is determining the firm's timetable. "In moving to *Windows*, I want to give users more, not less," Mallek says. Questions about *Windows*' printing and network support trouble him. "If it's not stable and causes problems, it would be giving them less. Until we get over the learning curve and really use what's there, why put up with problems?"

Exxon Corp.'s headquarters in Dallas takes a similar view. Though the company is planning to switch its approximately 200 *1-2-3* users from



Exxon's James Subisaretta is moving 200 *1-2-3* users from Release 2.01 to Release 3.1. He won't jump to *Windows* until the company is ready.

Release 2.01 to Release 3.1, Exxon has yet to determine when it will implement *Windows*. Even if *1-2-3 for Windows* were available right now, says James Subisaretta, associate adviser in the data-

RICHARD WATERS

management division of the Exxon controller's department, it wouldn't affect the office's schedule. "We just feel we need a good amount of hand-holding and training to exploit *Windows*, especially the first few applications that one might use," he says. "After that it should be easier, but we don't want to underestimate the initial part."

Ideally, says Subisareta, the corporate headquarters' jump to *Windows* will coincide with the move to 1-2-3 for *Windows*. But even if the shop feels ready for the environment before 1-2-3 for *Windows* comes out, it won't defect to *Excel*. Companies switching to *Excel* "will be more frustrated in the long run because they may be ahead of the learning curve for *Windows*," he predicts. "It's a big technical switch when everyone knows the good old 1-2-3 commands."

WINDOWS NOW, 1-2-3 LATER

Other companies are adopting *Windows* but continuing to leverage their investments in existing versions of 1-2-3. "We don't see any advantage to waiting" for 1-2-3 for *Windows*, says Bill Hills, director of worldwide medical, regulatory, and administrative information management at the R. W. Johnson Pharmaceutical Research Institute in Raritan, N.J. The institute, a unit of Johnson & Johnson, uses Digital Equipment Corp.'s VAX machines to support some 400 1-2-3 users on its PCs. The most common spreadsheet is 1-2-3 Release 2.2, but Hills is anxious to get the capabilities of 3.1.

That anxiety is a common theme in the move to *Windows*. "We feel vulnerable," says Paige Merriman, a computer programmer/analyst for the Systems Management Division of the U.S. Department of the Interior's Minerals Management Service. "We think there could be a lot of benefits from *Windows*, but we don't want to desert 1-2-3."

The service, which has 65 people running 1-2-3 Releases 2.2 and 3 under DOS 3.3 and Novell's *NetWare* 386, is also interested in sharing information among applications. The suburban Denver agency acts as the information-technology research and development center for several divisions of the Department of the Interior, creating many applications. Merriman wants to exchange data between accounting programs that track the agency's auditing and collection of royalties from mineral, oil, and gas leases on federal lands.

When Minerals Management started a *Windows* pilot with existing versions of 1-2-3, it ran into problems. Applications not specifically written for

Windows can hang up the '386 computers running in enhanced mode, says Merriman. *Windows* freezes when users try to switch from 1-2-3 to a graphing function. "There's an awful lot of trial and error trying to get things to work properly," Merriman says. "It's not as seamless and trans-



MICHAEL GARNETT

At the R. W. Johnson Pharmaceutical Research Institute, Bill Hills isn't waiting for 1-2-3 for *Windows*. He's upgrading 400 1-2-3 users to *Windows* now.

parent as we would like." She adds that Minerals Management could use DDE and the dynamic-update capabilities of true *Windows* software to build systems that can help the agency instead of running macros to move data.

WINDOWS VERSUS OS/2

For other users, the real challenge is choosing between OS/2 and *Windows* as the future corporate standard. This problem is especially acute for organizations that made early commitments to OS/2. The state of Louisiana's Office of Information Services faces just such a dilemma. It supports about 150 1-2-3 users in a number of agencies from its Baton Rouge offices. Most users are equipped with Release 2.01, but some have 1-2-3/G.

"Personally, I didn't like seeing *Windows* come out," says Donald Shedd, a management consultant in the state's PC/LAN support group. "We bought into OS/2 because we thought that would be the industry direction." OS/2 is part of Louisiana's commitment to IBM's OfficeVision applications suite, but now many state workers prefer *Windows*.

"I have to support OS/2 for applications development," Shedd says. "We don't know whether we

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"We feel we need a good amount of hand-holding and training to exploit *Windows*, especially the first few applications."

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can support both. If not, our *Windows* users may have to look elsewhere for support."

Sometimes, commitment to OS/2 can close the curtain on *Windows*. For about 4,000 1-2-3 users at Chicago's Continental Bank, for example, OS/2 is an integral part of the technology behind the institution's business turnaround. "We decided on OS/2 a couple of years ago when *Windows* just didn't have the oomph," says senior technical consultant Don Tabler, "and we see no reason to change at this point." He is happy with OS/2's graphical look and feel, common application interfaces, and multitasking performance. The bank uses mostly Release 3, but some employees use 1-2-3/G, Release 3.1, or Release 2.2.

"Like a lot of companies, we're under very tight financial controls," says Tabler. "The idea of changing direction and spending for something new is not one we like. Besides, *Windows* might be more powerful this week and OS/2 better next week. The company just can't change its strategy all the time."

GOODBYE, OLD FRIEND

For a few companies, the call to *Windows*, and to true *Windows* spreadsheets, is too strong to resist. Caltex Services Corp., a Dallas-based joint venture of Chevron Corp. and Texaco, is abandoning DOS and OS/2 for *Windows* and giving up 1-2-3 for *Excel*.

"Although 1-2-3 is the company-wide standard, we're moving to *Excel* almost by default," says Richard Cockcroft, supervisor of systems integration at Caltex, which develops industry-specific applications. "The nature of our business—oil-refinery information systems—lends itself to color and to pull-down menus. We're looking for productivity for those who don't like to navigate around keyboards." Engineers in Cockcroft's 16-person Dallas office want their own applications to be graphical, as well.

While many companies wait anxiously for *Windows* versions of key applications, such as 1-2-3 and *Word-Perfect*, Caltex found that the key applications it

needed—group scheduling and personal time-management tools—were available for *Windows* but were not available for OS/2. "OS/2 is a good operating system," Cockcroft says, "but the wealth of applications in *Windows* makes it hard to justify keeping it."

WAIT TILL NEXT VERSION

The future of 1-2-3 and *Windows* won't be clear for another year or so. The current situation presents both challenges and opportunities to Lotus Development Corp. and its customers. As Lotus developers burn the midnight oil to deliver 1-2-3 for *Windows* on time, 1-2-3 users struggle to make the transition to *Windows* while preserving their investment in their favorite spreadsheet.

The delivery of 1-2-3 for *Windows*—complete with pull-down menus, point-and-click operation, Dynamic Data Exchange, and full cut-and-paste among applications—will take much of the uncertainty out of the equation. A new, more stable release of *Windows* itself should also help. In the meantime, users will have to decide for themselves whether to look or leap. ▀

Clinton Wilder is senior editor, management, at *Computerworld* in Framingham, Mass.

"The idea of changing direction and spending for something new is not one we like. Besides, *Windows* might be more powerful this week and OS/2 better next week."



WINDOWS BASICS

This quick hands-on tutorial gives you what you need to know to negotiate any Windows application.

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**LOTUS GOES
GRAPHICAL**

BY LARRY ROSHFELD AND PHYLLIS A. SHARON

The *Windows* graphical environment is easy to use, largely because all *Windows* applications share certain characteristics. They all let you use a mouse; they all display information in a window; and they all let you use the same methods to manipulate windows on the desktop. In addition, they share certain commands for basic tasks.

But while *Windows* is considerably more intuitive than the character-based DOS environment, you'll still need a bit of training before you make the jump from DOS to *Windows*. This brief tutorial will get you started. You'll learn how to open *Windows* applications; navigate menus, dialog boxes, and multiple windows; use the Write, Paintbrush, and Clipboard programs; and in no time at all, move from being a *Windows* novice to a savvy user.

GET STARTED

To start *Windows*, type *win* at the DOS prompt. *Windows* operates in three modes: Real, Standard, and 386 Enhanced. Each mode offers a different level of functionality, and the one you should use depends on the capabilities of your PC. When you load *Windows*, it automatically starts in the most powerful operating mode that can run on your PC. (For more on the three modes and for tips on using *Windows* to run non-*Windows* applications like *1-2-3* Releases 2.x and 3.x, see "Lotus Does Windows," October 1990, page 34.)

When *Windows* is loaded, the entire screen becomes the *Windows* desktop. The desktop is a colored background upon which can reside one or more windows, each containing one application. Many application windows can be on the desktop at a time. Each window can contain a non-*Windows* application, such as *1-2-3* Release 2.2, or an application specifically designed for *Windows*, such as *Ami Pro* or *1-2-3 for Windows*.

Program Manager, one of the many applications

included in *Windows*, is the first window that appears and the only application that runs the entire time you're in *Windows*. Using Program Manager, you can organize applications into program groups (for example, Games, Utilities, and Business), which are analogous to file folders. Within the Program Manager application window, each program group is represented by a group icon, and each application within the group is represented by an icon and the name of the application. Figure 1 shows a typical *Windows* work session.

Windows comes with three program groups: Main, Games, and Accessories. Programs in the Main group perform system-related tasks, such as working with files and directories, configuring hardware, setting up a printer, or changing the *Windows* setup. The Games group contains the Solitaire and Reversi games. The Accessories group provides 10 simple applications, including a word processor, a notepad, a calculator, and a card file.

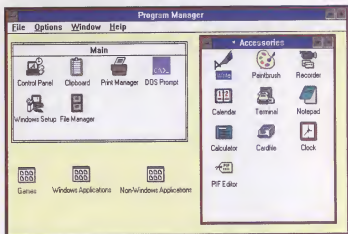


Figure 1. Here, three windows—Program Manager, Main, and Accessories—are open on the desktop. The Main and Accessories windows contain applications, each of which appears as an icon. Starting an application is as easy as double-clicking an icon.

SPECIAL REPORT

LOTUS GOES GRAPHICAL



CLICK AND RUN

Suppose you want to look at the applications in the Accessories program group. Double-click the Accessories icon by positioning the mouse pointer on the icon and rapidly pressing the left mouse button twice. A new window, called Accessories, appears. The window contains 10 icons, each of which represents a different application. To start one of the applications, double-click its icon.

Double-click the Write icon. A new window appears. The title bar contains the window's name and the file name—in this case, *Write-(Untitled)*. The menu bar lists a variety of word-processing commands, along with Help. Within the Write application, the mouse pointer appears as an I-bar. The insertion point, or the place where text will appear when you type, is identified by a blinking vertical bar. To move the insertion point to the location of the mouse pointer, position the mouse and click the left mouse button. The end mark indicates the end of the document. Since there's no text in this window, the end mark appears next to the insertion point. When you work in Write, you cannot move the insertion point beyond the end mark.

Let's type a memo to the marketing staff. Enter the following text, or enter some of your own.

To: Marketing Staff

From: Drucilla Quest

Date: June 15, 1991

Re: Bumbles Packaging Study

The results of the third annual packaging study are in. Of the 10,000 customers who participated in the study, 85% approve of the new packaging introduced in the Bumbles line. Customers were especially happy with the biodegradable carton, made from recycled paper. 75% stated that the new, bolder logo grabbed their attention. (See copy of logo below.) This should ensure that the Bumbles line continues to enjoy a high point-of-purchase lure.

If you make a mistake while you're typing, press the Backspace key to delete one letter at a time. To erase an entire section of the memo, position the mouse pointer and drag the mouse to select the section, then press the Delete key. To replace text, position the pointer, drag to select the text you want to replace, then begin typing the new text. Write erases the area as soon as you begin typing. These tips should get you started. You can explore the menu options on your own.

After typing the memo, click File on the menu bar. All *Windows* applications have menu bars, which present an initial set of commands horizontally across the screen. Subchoices appear in boxes below the main menu.

You can select a menu item in three ways. You can position the mouse pointer on the item and click the left mouse button once. You can press the Alt key and then use the Arrow keys to highlight the item and then press Return. Or you can press Alt and type the single letter that is underscored in the menu item.

Be aware that the letter you type to select a menu item is not always the first letter in the word, as it is in 1-2-3 menus. For example, on the File menu that is displayed on your screen, the commands Save and Save As appear. To select Save, you type an S. To select Save As, you type an A.

Use whichever method you prefer to select Save. The dialog box that appears shows the current directory. If you wish to save the file to the current directory, just type the file name *memo* and press Return. Otherwise, use the Directories box to specify a different directory and path and then type the file name. As soon as you enter the file name, Write saves the file and the dialog box vanishes. Now the title bar in Write says *Write-MEMO.WRI*. (If the color of your desktop is white, the file name won't appear. To change the color of the desktop, use the Color option located in the Control Panel accessory, which is part of the Main group in Program Manager.)

You'll want to get back into Write later, so put it aside but keep it running. To do this, turn the window into an icon by clicking the minimize button, shown as a small downward-pointing arrow in the upper-right corner of the window. The display now shows the Program Manager and Accessories windows, and the Write window appears as an icon at the bottom of the display. Under the icon is the current file name, *MEMO.WRI*. (If your desktop is white, the file name won't appear.) When it's time to get back into the file, just double-click the Write icon.

MAKE A DRAWING

Now that you've saved the memo, let's create a drawing of the Bumbles logo and then copy it into the memo. To create a drawing, use the Paintbrush application located in the Accessories program group. Double-click the Paintbrush icon. The program starts and appears in a new window superimposed over the Program Manager and Accessories windows.

Now you're free to design the logo that will accompany the memo. Before you start drawing, maximize the Paintbrush window so that you have

a larger work area. Click the maximize button, shown as a small upward-pointing arrow in the upper-right corner of the window, and the Paintbrush window fills the display.

To create a simple drawing, first select one of the drawing tools that appear in boxes along the left side of the display. Each tool has a different use. To draw free-hand, use the paintbrush. To erase an area, use the eraser. To add text to a drawing, use the text tool, shown as the icon containing the letters *abc*. To select a tool, point to it with the mouse and click the left mouse button. To draw, position the cursor where you want to begin drawing, press the left mouse button, and drag the mouse to create the drawing. Repeat this process with each tool you wish to use.

When you're through creating the logo, click File and then click Save. A dialog box appears. If you wish to save the file to the current directory, just type the file name *logo* and press Return. Otherwise, use the Directories box to specify a different directory and path and then type the file name. As soon as you enter the file name, Paintbrush saves the file and the dialog box vanishes. This process should seem familiar to you, since you used those same commands to save the Write file.

CUT 'N' PASTE

To copy the logo into the memo you wrote, use commands found under the Edit option on the menu. In *Windows* applications, data that is copied or cut is temporarily placed on the *Windows* Clipboard, which is one of the applications that comes with *Windows*. The Clipboard lets you copy, cut, and paste data not only within a *Windows* application but also between applications, such as from your spreadsheet to your word processor.

To place data on the Clipboard, select the area containing the data, then select either Edit Copy (to copy the selected area to the Clipboard) or Edit Cut (to move the selected area to the Clipboard). In this case, you want to copy the logo from Paintbrush to Write. To select the area containing the logo, use one of the two cutout tools, both of which have scissors in their icon. The scissors-and-star icon lets you define a free-form cutout. The scissors-and-box icon lets you define a rectangular area to cut out.

Select the tool that will work best with your drawing. Then position the cursor on the drawing area and drag the mouse to specify the area containing the logo. The selected area will appear surrounded by dashed lines. If this is not exactly the area you want to cut out, move the mouse pointer outside the dashed lines and click once. The lines vanish, and you can begin again.

After you have selected what you want to copy to

The Clipboard lets you copy, cut, and paste data not only within a *Windows* application but also between applications.

the Clipboard, click Edit. A box appears. If you select Cut, the drawing will move from the current file to the Clipboard and then vanish from the current Paintbrush window. If you select Copy, only a copy of the drawing will go to the Clipboard. The original will remain in the current file. Select Copy.

Click the minimize box to minimize the Paintbrush window. Now the Paintbrush icon appears at the bottom of the display, along with the name of the Paintbrush file. (If your desktop is white, the file name won't appear.) To make sure that the drawing is on the Clipboard, click the Main icon in Program Manager, and then double-click Clipboard. You'll see that your drawing is indeed on the Clipboard. Now you're ready to copy the drawing into the memo.

Double-click the Write icon at the bottom of the display. The Write window containing your memo reappears. Move the mouse pointer below the memo text and click the left mouse button once. The insertion point moves to the left of the end mark. To paste the contents of the Clipboard, click Edit and select Paste. The logo appears at the bottom of the memo. The memo looks something like figure 2.

Now be sure to save the memo. Click File and select Save to save the memo under its original name. Or, to save it under a new file name, click Save As, and enter a new file name.

PRINTING AND MORE

Once you have installed and configured the *Windows* print driver for a particular printer, you can print to that printer from all of your *Windows* applications.

In addition to allowing applications to share print drivers, *Windows* provides the Print Manager, which lets you print from the background while you do other work. For example, you can print one document from a *Windows* word processor while you work on another document or while you work in another application. When you print from a *Windows* application, a print file is sent by the application to the Print Manager. The Print Manager stores each print file and sends it to the printer when the printer is ready to receive data.

Keep in mind that only *Windows* applications take advantage of *Windows* print drivers and Print Manager. Standard DOS applications that have not been rewritten to run under *Windows* do not use

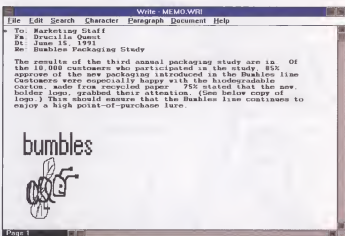


Figure 2. Merging text and graphics is no problem when you use the Clipboard. Here, a drawing made in the Paintbrush application has been brought into a memo written in Write.

the *Windows* print drivers or the Print Manager. They just print as they always have under DOS.

If you want to print your work, click File and then click Print. A box appears indicating the printer that you'll print to. If you wish, you can specify the number of copies to print and the quality of the print. When you're ready to print, click OK. If your work doesn't print, check the *Windows* manual for help.

When you want to switch to another application, double-click the *Windows* desktop, the area below the Write window's bottom border. If, for some reason, you cannot see the desktop, hold down the Control key and press the Escape key. Either method brings up the Task List box, which lists all the active windows. To switch to one of the listed applications, double-click its name. Let's double-click the Program Manager.

The Program Manager window reappears. If you wish, you can explore some of the other applications included in *Windows*. For example, the File Manager, included in the Main program group, lets you view, create, and delete directories; copy, delete, and erase files; and format disks. Or perhaps you want a break from all your work. Try playing Reversi or Solitaire.

When you want to terminate your *Windows* session, double-click the Control menu box, shown as a dash in the upper-left corner of the Program Manager window. The Exit *Windows* box appears. Click the Save Changes box to save any changes you might have made to any open files. *Windows* will go through each open window and give you a chance to save each open file. When you're through, click OK to end this *Windows* work session. ■

Larry Roshfeld is a sales-planning manager for Lotus Government Marketing in Washington, D.C., and a frequent contributor to *LOTUS*.

THROWING OPEN WINDOWS

No matter what your needs, there's probably a Windows application to fill them.

SPECIAL
REPORT

LOTUS GOES
GRAPHICAL

BY CHRISTOPHER O'MALLEY

With a slick new *Windows* version of 1-2-3 soon to be released, is it time to abandon the character-based world of plain old DOS and embrace the graphical world of the *Microsoft Windows* environment? Maybe.

As Microsoft Corp., IBM, and others have learned the hard way, computing "platforms" aren't nearly as important to users as the applications that stand upon them. And while 1-2-3 for *Windows* clearly makes *Windows* more viable for people who have geared their businesses around 1-2-3, it takes a variety of components to balance the graphical equation—components like word processing, database management, presentation graphics, desktop publishing, and communications, to name a few.

The good news is that many of these applications are here, and many more are on the way. More than 700 software developers are at work on *Windows* applications, according to Microsoft, which has shipped more than 48,000 copies of its *Windows* Software Development Kit since the debut of *Windows* 3.0 last May. *Windows* software has become the central or sole focus of development efforts for many companies, and software sales are beginning to reflect that fact. Sales of *Windows*-based applications will jump to 3.8 million copies this year—an increase of 150% from 1990 sales, according to International Data Corp., a market research firm in Framingham, Mass. IDC predicts another triple-digit increase for 1992.

The bad news is that despite all of this activity, the *Windows* contingent does not yet rival the diversity—and in some cases, the depth—of regular DOS programs. And there are still some key pieces missing from the *Windows* puzzle, which could dissuade you from making the move just yet.

WORD PROCESSING

If a good word-processing complement to your *Windows* spreadsheet is your primary concern, however, the reasons for waiting have all but evaporated. Lotus Development Corp.'s *Ami Pro* and Microsoft's *Word* for *Windows* amply meet the

need for full-featured word processing that takes advantage of *Windows*'s WYSIWYG (what-you-see-is-what-you-get) environment. You could make a strong case for choosing either (*Ami Pro* for its ease and charting and drawing features; *Word* for its depth and automation features), which says a lot about the healthy state of word processing under *Windows*.

A forthcoming *Ami Pro* upgrade is expected to beef up the package's text-handling features and provide closer ties to other Lotus *Windows* applications.

Waiting on *WordPerfect*? Your wait is nearly over. A *Windows* version of *WordPerfect* is imminent, and it promises to deliver its predecessor's trademark comprehensiveness in a much more intuitive setting. Software Publishing Corp.'s popular *Professional Write* has already made the move. The recently introduced *Professional Write Plus* for *Windows*, which is partly derived from Ami technology, is an easy-to-use, moderately priced package with a number of



extras, including a grammar checker and a built-in electronic-mail function.

Other familiar names in word processing have emerged as *Windows* contenders, as well. WordStar International weighs in with *Wordstar Legacy*, which emphasizes advanced page-layout features. IBM teamed up with Xyquest (makers of *XyWrite*) to develop *Signature*, a *DisplayWrite* successor that should be available soon.

DESKTOP PUBLISHING

There are fewer titles to choose from in the desktop-publishing arena, but for many people, the only PC programs that matter are Aldus Corp.'s *PageMaker* and Ventura Software's *Ventura Publisher*, and both are available under *Windows*. (See "Publish It Yourself" in this issue for a review of desktop-publishing programs.) *PageMaker*, of course, has long run under *Windows* (as well as on the Macintosh), and the recent version 4.0, which adds major new word-processing functions to its pasteboard design features, solidifies *PageMaker*'s position as the premier package of its kind. *Ventura Publisher* is a newcomer to *Windows* (having previously run under Digital Research's *Gem* environment) but an old hand at managing page design, particularly for lengthier documents.

If three's a crowd, then the *Windows* desktop-publishing field will soon be jammed, with the addition of Quark's *QuarkXPress*, one of the most powerful page-layout programs for the Mac. Sources say the company is targeting a fourth-quarter release after missing a mid-year goal.

DATABASE

You'll enjoy no such bounty in *Windows* database products, however. At this writing, none of the major DOS relational databases—including *dBase*, *Paradox*, *FoxPro*, and *R-Base*—is available in a *Windows* version, nor have dates been set for their arrivals.

But the database drought may not last much longer. Ashton-Tate Corp., for one, says that it intends to deliver a *Windows* version of *dBase* before the end of the year. Borland International says that it intends to support *Windows* with its database products but has provided no timetable for *Paradox*. Borland has already delivered its *Paradox Engine* for *Windows*, however, which enables users to develop database applications that create, read, and write *Paradox* tables.

In the meantime, there are a handful of lesser-known database products that might fill the bill. Precision Software's *Superbase 3* has emerged as a solid relational database that can also handle

images in a variety of formats. A recent update gives application builders access to SQL database servers, such as Microsoft's *SQL Server* and Gupta Technologies' *SQLBase Server*. The program is also available in an "executive" version, without development tools, called *Superbase 2*. Blyth Software's *Omnis 5*, kin to its Macintosh counterpart, is another good choice for serious users, as is Ventura Software's *FormBase*, which pairs a relational database with form-design capabilities.

Even in the absence of the big names, activity is picking up. A new database package, Malachite Corp.'s *Dossier for Windows*, offers relational capabilities and compatibility with Ashton-Tate's *dBase III Plus* and Nantucket Corp.'s *Clipper*. Numerous "front ends" to database servers on client/server networks have appeared lately, too, and more are on the way. Quadbase Systems and Vinzant Inc. recently unveiled *Windows*-based, back- and front-end products, respectively, to SQL servers, for instance. Microrim, the publisher of *R-Base*, is known to be working on a *Windows* front end, tentatively called *Vanguard*, that will work with a variety of database servers, plus read and write *dBase* and *R-Base* data files.

ACCOUNTING

The situation is much the same with *Windows* accounting software: It's been slow to arrive, but the market is now showing signs of life. Peachtree Software became the first major vendor to offer a comprehensive accounting system with its recent introduction of *Crystal Accounting*, which is based on a product formerly marketed as *Bookkeeping By Design*. Designed for small to midsize businesses, *Crystal Accounting* includes general-ledger, accounts-receivable, invoicing, accounts-payable, payroll, and financial-report modules. But Peachtree won't be alone for long. A number of accounting-software companies, including SBT Corp. and Great Plains Software, are working on new *Windows* products set for release this year.

Several *Windows* accounting packages from smaller companies have also made their way to market, including Brown-Wagh Publishing's *Sybiz Windows Accounting* and Absolute Solutions' *Computerized Classic Accounting*.

GRAPHICS

If turning data into graphics turns your head, then you'll find that the very best PC tools are now *Windows* tools. And they are coming from all directions. Lotus's *Freelance Plus* makes the transition from DOS to *Windows* in spectacular fashion (see "Lotus Links Its Windows Programs"

in this issue), and so does Software Publishing's *Harvard Graphics*. IBM expected last month to debut a presentation-graphics product of its own, called *Hollywood*.

Microsoft's and Aldus's new presentation-oriented packages, *PowerPoint* and *Persuasion*, have proved that you can make a good thing on the Mac even better under *Windows*. Micrografix, which has been toiling at *Windows* graphics software longer than anyone, has another winner in *Charisma*, the successor to its well-regarded *Graph Plus*, which also ran under *Windows*. Zenographics's *Pixie* and Bloc Publishing Corp.'s new *3-D Charts to Go!* offer simpler alternatives.

CAD fans have considerably less to cheer about. While several *Windows*-based computer-aided-design programs are now available—Foresight Resources Corp.'s *Drafix Windows CAD* and Ashlar's *Vellum for Windows*, to name two—the best-known names, including Autodesk's *AutoCAD*, are still on the DOS sidelines. They'll eventually be converted, and there may be ways to work around the incompatibilities in the meantime. SoftSource's *Drawing Librarian-Windows* lets you view and print *AutoCAD* files in *Windows*, for example.

COMMUNICATIONS

Communications software, however, is no longer in short supply. In addition to good general-purpose communications programs like *CrossTalk for Windows* from Digital Communications Associates (DCA) and *DynaComm Asynchronous* from FutureSoft, there are now numerous E-mail options, including Microsoft's recently acquired *Network Courier for Windows*, Da Vinci Systems Corp.'s *eMail for Windows*, and Lotus's recently acquired *cc:Mail*. E-mail, of course, is at the heart of *Lotus Notes*, the groupware package that runs under *Windows* on DOS-based PCs.

There are also several good PC-to-mainframe packages, including DCA's *IRMA Workstation for Windows*, Attachmate Corp.'s *Extra! for Windows*, IBM's *Windows Connection*, and FutureSoft's *DynaComm/Elite*. And there's at least one remote-control package in the works, a product called *ReachOut* by Ocean Isle Software.

PROJECT MANAGEMENT AND MORE

Windows has attracted other types of applications software development, too. Microsoft's *Project for Windows* helped transform project management into a much more graphical art. *Windows* versions of Seltor Corp.'s *Project Scheduler 5*, Computer Associates International's *Super Project*, and Symantec Corp.'s *Time Line* are

expected soon. Symantec has already announced *On Target*, a less-expensive *Windows*-based project planner (see "On Target: Project Management for *Windows*," May, page 86). Delrina Technology's *PerForm Pro*, JetForm Corp.'s *JetForm*, and Ventura Software's *FormBase*—all running in *Windows*—have done the same for forms management. Senior management (a.k.a. decision makers) has not been ignored, either. Executive information systems include Pilot Executive Software's *LightShip*, Software Publishing's *InfoAlliance*, and IMRS's *OnTrack*. IMRS also sells a program called *Executive Forum*, which provides a tight link between *OnTrack* and *Notes*. Interpreting tools, close cousins to executive information systems, include Bell Atlantic Software Systems' *Think* and Channel Computing's *Forest & Trees*.

On a much smaller but maybe no less important scale, there are now plenty of *Windows* file- and icon-management utilities. Abacus's *BeckerTools*, hDC Computer Corp.'s *FileApps*, Threadz Software Design Group's *File F/X*, and NewTools' *Aporia* are good examples of the former, while Software Workshop's *Icon Pak I and II* and WinSoft's *Icon Draw* are typical of the latter. Even the newest version of *PC Tools Deluxe* gets into the act, with "unerase" and program-launching features for *Windows*.

If you can't find what you need under *Windows*, you may be able to create it yourself. *Windows* has become fertile ground for visual programming tools, which enable adventurous users and professional programmers to develop applications by manipulating "objects" (representing data or functions) rather than writing arcane code. Asymetrix Corp.'s *ToolBook* is the best known and probably the simplest of this genre, but there are already quite a few others: Spinnaker Software Corp.'s *Spinnaker Plus*, Borland's *ObjectVision*, ObjectSoft Corp.'s *Relate*, Knowledge Garden's *KnowledgePro Windows*, and The Whitewater Group's *Actor* are among the choices.

Serious developers can opt for more serious tools, including not only Microsoft's own development kit, but Borland's *C++* and *Turbo Pascal for Windows*, as well. And Microsoft was expected to release *Visual Basic for Windows* at last month's *Windows World* conference in Atlanta.

And lest we begin to think that *Windows* software is all work and no play, there's Microsoft's game collection, *Entertainment Pack for Windows*, as well as screen-saver programs like Berkeley Systems' *After Dark* and Icom Simulations' *Intermission*, which offer fireworks, flying toasters, tropical fish, and a variety of other entertaining images. ■

Christopher O'Malley is a free-lance writer based in Delray Beach, Fla., and a frequent contributor to *LOTUS*.

**SPECIAL
REPORT**
**LOTUS GOES
GRAPHICAL**

More than 700 software developers are at work on *Windows* applications, according to Microsoft.

dFacts Are In.

DATABASE COMPARISON TABLE	dBASE IV version 1.1	Paradox version 3.5	FoxPro version 1.02
EASE OF USE			
Control Center organizes data, queries, forms, reports, labels, applications on one screen	Yes	No	No
Create applications <i>without programming</i>	Yes	Yes	No
Modern pulldown menus for all Design Tools	Yes	No	Limited
Query by Example (QBE) for easy access to information	Yes	Yes	No
Context specific help by menu item	Yes	No	No
PRODUCTIVITY			
Quick Layout for automatic forms, reports and labels	Yes	No	Yes
Application Generator for quick application development	Yes	Yes	No
Automatic code generation for all Design Tools	Yes	No	No
Automatic maintenance of multiple indexes for ordering data	Yes	No	No
Memo fields for notes, letters, descriptions	Yes	No	Yes
POWER & FLEXIBILITY			
Bold, underline, italic, subscript, superscript text for high impact reports and labels	Yes	No	No
User Defined Functions for extending programming language	Yes	No	Yes
Data input validity checking in forms	Yes	Yes	Yes
Multi-user transaction processing ensures data integrity	Yes	No	No
Number of file formats imported/exported	7	6	3
INDUSTRY STANDARDS			
#1 Selling, #1 Rated multiuser database; over 3 million users (1)(2)	Yes	No	No
Compatible with dBASE III PLUS data and applications	Yes	No	Yes
Compatible versions for DOS, VAX VMS, Macintosh, SunOS and other UNIX platforms (3)	Yes	No	Limited
Structured Query Language (SQL) integrated with programming language	Yes	No	No

(1) dBASE III PLUS and dBASE IV comprise approximately 55% of PC database systems sold (3 times nearest competitor) according to the most recent report by the market research firm Audit & Surveys (Oct. 1990) (2) Software Digest rated dBASE IV #1 among multiuser databases, October 1990 (3) Versions of dBASE IV are shipping for DOS, VAX, and SunOS. Macintosh and other UNIX Platforms are announced

Based on what our customers tell us, we made a list of some of the most important features to look for in data management software.

Then we compared the new dBASE IV® version 1.1 with two other database products.

As you can see, dBASE IV offers exclusive advantages in

many categories.

For instance, only dBASE IV lets you access all its functions from a single screen. Called the Control Center, this screen lets you manage existing data, and create new tables, queries, reports, forms and labels totally without programming.

When all the facts are on the table, it's easy to see which database software is best.

Of course we aren't the only ones who have come to this particular conclusion.

Software Digest rates dBASE IV version 1.1 the #1 Multiuser Database (Vol. 7, No. 13, Oct. '90).

dTruth Comes Out.

Software Digest

RATINGS REPORT

The Independent Comparative Ratings Report for Selecting IBM PC Business Software

Volume 2 Number 13

MULTIUSER DATABASE PROGRAMS

Ratings Key: ■ 70-100 ■ 50-69 ■ under 50

Software Digest Rating	Overall Evaluation	Overall Power	Program Name	Version	Required Performance	Reliability	Error Handling	Ease of Learning	Memory Requirement	Price	Volume Purchase Agreement	Page
***	70	67	dBase IV	1.1	■	■	■	■	450KB	\$795	✓	28
**	6.8	51	Paradox	3.5	■	■	■	■	640KB	\$995	✓	32
**	6.8	71	FoxPro/LAN	1.02	■	■	■	■	512KB	\$1,095	✓	30
**	6.4	51	DataEase	4.2	■	■	■	■	640KB	\$750	✓	26
*	5.8	3.6	R-Base	3.0	■	■	■	■	520KB	\$995	✓	34
✓	5.7	6.0	Claris Professional Developer	2.1	■	■	■	■	512KB	\$845	✓	24
*	5.7	6.6	Advanced Revelation	2.01	■	■	■	■	640KB	\$995	✓	22

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Perhaps the most independent publication in the industry, *Software Digest* accepts no advertising whatsoever. Corporations pay hundreds of dollars a year to receive their monthly reviews—which are considered highly unbiased and objective. Their exhaustive, 75-page report concludes:

"Among the top ranking programs, dBASE IV (version 1.1) is the most well-rounded, with solid performance, versatility, and usability." Commenting on speed, *Software Digest* points out that "dBASE IV produces all three test reports as fast as or faster than FoxPro/LAN." As for Ease of Use and Ease of Learning, dBASE IV scored in the Excellent Range as many times as any other multiuser database product tested.

For a free evaluation kit, including competitive details and a free demo disk, call toll-free: 1-800-437-4329 ext. 1416. Better yet, call 1-800-2ASHTON to upgrade to the new dBASE IV now.

The truth is, no other database can do so much to improve productivity.



dBASE IV
Advanced Professional Developer of the dBASE III and dBASE III PLUS

Ashton-Tate

Should You Buy

For investment properties, cash flow tells the tale. BY STEPHEN L. NELSON

At 2902 13th Street in Everett, Wash., a few miles to the north of Seattle, there's a 24-unit apartment complex for sale that's supposed to be a sweet deal. The location is prime: down the street from a clean, modern supermarket, close to the freeway, and just minutes from where Boeing builds 747s. With a price tag of \$1.56 million, the property seems tempting. But is it really a good investment?

The answer, of course, is "it depends." Like any investment analysis, a real estate deal should compare the cost of the investment with the revenues it will generate. But other factors, such as inflation and interest rates, take on added significance when it's buildings you're buying. And if the deal is structured with different levels of equity, the profit potential and risk may vary dramatically, depending on what kind of equity you hold.

Professional real estate investors use spreadsheet models to see whether a deal like this one makes sense. The investment template in this article is drawn from a

similar blueprint. The model works in *1-2-3* Releases 2.x and 3.x and in *Symphony* Release 2.x, and you can use it to analyze real estate investments ranging from single-family homes to properties selling for \$10 million or more. To build the model, use the instructions in the setup box.

If I Had a Hammer

Figure 1 divides the model's inputs into five sections: income, expenses, inflation, financing, and resale.

Range A10..D12 contains a description of the 24 revenue-producing units at Pine Village, the property that's for sale. The complex comprises 4 one-bedroom units that rent for \$450 each, 8 two-bedroom units with back yards that rent for \$585 each, and 12 two-bedroom units without back yards that rent for \$575 each.

In addition to the rent, most properties generate a small amount of income from ancillary fees and services. At Pine Village, for example, the property manager

reports that late-payment penalties, parking fees, revenues from coin-operated laundry machines, and other miscellaneous income amount to \$5 per unit per month. This input goes in cell D14.

The four inputs in range C20..C23 summarize the monthly expenses that come with ownership of the apartment complex. Operating expenses, in cell C20, include advertising, maintenance, repairs, utilities, and garbage removal.

The value in cell C20 is derived from a supplemental worksheet that accounts for each of these expenses, item by item, for the entire property. By totaling these costs and then dividing by the number of units in the property, the property manager came up with a reliable operating expense estimate of \$100. This figure is typical for the Seattle area. Local property managers should have a good idea of the operating expenses for buildings in your area.

Tax and insurance expenses, the property's major fixed costs, are entered in cell C21. At Pine Village the figure is \$50.



ILLUSTRATIONS BY CONSTANCE JACOBSON; PHOTOGRAPHY BY BRUCE MCKIM

This Building?

To estimate these costs in your area, consult local property managers or call insurance agents and the local assessor's office.

Cell C22 contains the costs or fees associated with property management. In the Seattle area, as in many locations, property management fees run from 4% to 6%. At Pine Village, the current contract calls for a 4% fee.

The final expense item is the property's expected vacancy rate, in cell C23. Generally, the property you are analyzing will have the same vacancy rate as properties of comparable price and quality in the area. You can usually get an estimate of this rate from local appraisers and lenders. In any case, the vacancy estimate should usually be at least 5%, to account for the transitional vacancy that occurs when you have to re-lease a unit after a tenant moves out.



The model described in this article is available on disk. See page 1 for details.

The Big Roller Coaster

The real estate boom of the 1980s was rooted in the high inflation rates of the late 1970s. Back then, real estate seemed to be an unbeatable investment, because revenues inflated at the same rate or at a greater rate than expenses, while debt service remained constant. With rents escalating 10% or more each year, investors could easily justify even mediocre projects.

Don't make that mistake today. Real estate values are climbing much more slowly, and they are actually declining in some places as the market retreats from earlier excesses. This template, like most real estate models, will return spectacularly inaccurate results if you overestimate the income-inflation rate.

This model uses a conservative annual income-inflation rate of 3% (entered in cell C28)—about the same rate that overall consumer prices have grown yearly during the past 60 years. It inflates the project's expenses at the same rate (cell

C29). If you have well-researched projections of the property taxes, insurance fees, utility rates, or other expense items that apply to your property, you can factor them into your estimate.

Financing the Deal

The financing inputs in range C35..C41 describe the terms of the purchase. This template allows you to divide the financing among three groups: the lender, the preferred equity holders, and the residual equity holders.

The deal for Pine Village works like this: The lender, a local bank, will fund \$1.2 million of the \$1.56 million purchase price. This input goes in cell C35. Preferred equity holders account for another \$300,000 (cell C38). The remaining \$72,000 comes from the residual equity holders, (cell C41). Cell C43 adds up these three amounts, then subtracts the origination costs that are added to the mortgage, to confirm that they equal the stated \$1.56 million purchase price of the property.



A	B	C	D
REAL ESTATE INVESTMENT ANALYSIS TEMPLATE			
MODEL INPUTS			
Income			
Unit description	# Units	Average	Rent
1-bedroom	4	\$450	
2-bedroom with back yard	8	\$585	
2-bedroom without back yard	12	\$575	
Miscellaneous income per unit	24	\$5.00	
Expenses			
Operating expenses	\$100.00		
Taxes/Insurance	\$50.00		
Property management	4.00%		
Vacancy rate	5.0%		
Inflation			
Income	3.00%		
Expenses	3.00%		
Financing			
Mortgage amount	\$1,200,000		
Origination costs	1.00%		
Mortgage interest rate	9.00%		
Preferred equity amount	\$300,000		
Preferred equity rate	8.00%		
Preferred share excess	65.00%		
Residual equity amount	\$72,000		
Purchase price	\$1,560,000		
Resale			
Selling expenses	4.00%		
Exit capitalization	6.70%		

Figure 1. Inputs for the real estate investment analysis. The exit-capitalization rate is calculated in cell C49.

The origination fee for the \$1.2 million mortgage is 1% (cell C36), and the mortgage interest rate is 9% (cell C37). The preferred equity holders are promised an 8% return on their money (cell C39). If there's any money left, the preferred shareholders will get 65% of it (cell C40), and the residual shareholders will get the rest.

What the Numbers Mean

The cash flow forecast section of the model in figure 2 calculates the cash flows associated with the entries in figure 1. Formulas in row 58 calculate the estimated rental income over the 10-year period, using the rent structure in range C10..D12 and the income inflator in cell C28. Miscellaneous income (row 59) also depends on the value in cell C28.

In row 60, the model calculates 5% of total income to account for the estimated 5% vacancy rate (cell C23). The formulas in row 62 subtract the vacancy expenses from total income to arrive at effective gross income.

The operating expense and the tax/insurance expense (rows 66 and 67) grow at 3% each year, the rate of inflation specified for expenses in cell C29. The property management expense (row 68) is a function of the project's

gross income. The @SUM formulas in row 70 add these three items to get an estimate of total expenses.

Formulas in row 72 calculate the project's net operating income by subtracting total expenses from effective gross income. The cash flows in row 75 equal net operating income, except in year 10, when the model estimates a \$2,012,649 influx of cash from the sale of the property.

These cash flows are at the foundation of the investment analysis in figure 3. The figure includes a Year 0 column to hold the financing inputs that occurred at the outset of the deal. For example, the initial cash flow for the project (cell C84) is -\$1,572,000, which represents the property's \$1,560,000 cost plus the \$12,000 loan-origination fee. Of that amount, \$1,200,000 came from the lender (cell C85), \$300,000 came from the preferred equity holders (cell C90), and \$72,000 came from the residual equity holders (cell C95).

The mortgage lender has first rights to the project's cash flow, so debt service appears directly below, in row 85. Like many properties of its size, Pine Village is being financed with a "bullet loan," which means that there is no amortization and that the entire loan balance is due at the end of the 10-year loan period.

If the property that you're interested in carries a fixed, amortizing loan, replace the formula in cell D85 with @PMT(\$C35,\$C37/12,years*12)*12, where years is the length of the fixed mortgage. Copy this formula to range E85..M85.

A	B	C	D	E	F	G	H	I	J	K	L	M	N
CASH FLOW FORECAST													
	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year
	1	2	3	4	5	6	7	8	9	10	11		
Gross income													
Rent	\$160,560	\$165,377	\$170,338	\$175,448	\$180,712	\$186,133	\$191,717	\$197,469	\$203,393	\$209,454	\$215,779		
Miscellaneous income	1,440	1,483	1,528	1,574	1,621	1,669	1,719	1,771	1,824	1,879	1,935		
Less: Vacancy	(8,100)	(8,343)	(8,593)	(8,851)	(9,117)	(9,390)	(9,672)	(9,962)	(10,261)	(10,569)	(10,886)		
Effective gross income	153,900	158,517	163,273	168,171	173,216	178,412	183,765	189,278	194,956	200,805	206,829		
Expenses													
Operating expenses	28,800	29,664	30,554	31,471	32,415	33,387	34,389	35,420	36,483	37,577	38,705		
Taxes/Insurance	14,400	14,832	15,277	15,735	16,207	16,694	17,194	17,710	18,241	18,789	19,352		
Property management	6,156	6,341	6,531	6,727	6,929	7,136	7,351	7,571	7,798	8,032	8,273		
Total expenses	49,356	50,837	52,362	53,933	55,551	57,217	58,934	60,722	62,533	64,398	66,330		
Net operating income	104,544	107,680	110,911	114,238	117,665	121,195	124,831	128,576	132,433	136,406	140,498		
Residual from sale										2,012,649			
Cash flows	104,544	107,680	110,911	114,238	117,665	121,195	124,831	128,576	132,433	138,455	2,149,055		

Figure 2. The cash flow forecast. The model uses the income, expense, and inflation inputs from figure 1 to calculate annual cash flows for the property. At the end of the tenth year, the model predicts the property's selling price (cell M73) using the projected cash flow for the eleventh year and the resale inputs in figure 1.



Getting Out

The conventional method for valuing a real estate investment assumes that the investor sells the property at the end of the tenth year. This whopping cash flow shows up as a residual from sale, in cell M73. Because the property is sold all at once, there are no residuals from sale in the other years of the analysis.

To estimate the sale price at the end of the tenth year, the model divides the projected eleventh-year income, in cell N72, by the exit-capitalization rate in cell C49. This exit-capitalization rate equals the purchase-capitalization rate, which the model calculates by dividing first-year income by the purchase price.

Sales commissions, transfer taxes, legal fees, and escrow will all take a bite out of the back end of your investment. For Pine Village, these costs are estimated at 4% (cell 48). But be careful. While the percentage can be lower for larger properties, it can be higher for smaller ones.

Many Unhappy Returns

The @IRR formulas in range C100..C103 calculate the internal rates of return for the project as a whole, for the equity

required to finance the project, and for each class of equity investor.

According to the terms we've established, this deal is marginal at best. The project's overall return on investment, 9.28%, is hardly overwhelming. Because the lender's return is fixed at 9%, though, the equity holders exceed the overall return on investment. Overall return on the project's \$372,000 million of equity is estimated at 9.92%.

Preferred equity holders, who expected a return no lower than 8%, do a little better at 10.11%. But the residual equity holders, who took the greatest risks at the bottom of the investment totem pole, enjoy only a 9.15% return.

So, should you buy this building? Probably not with these numbers. The projected equity returns are too low to justify the investment. What's more, they're based almost entirely on the resale value of the building at the end of 10 years, which is hardly a sure thing. The preferred equity holders don't receive their \$24,000 minimum payment until the ninth year. Nor do the residual equity holders see any positive cash flow until then.

On the other hand, real estate in the Seattle area has done much better during the current recession than properties in other parts of the country. And because Pine Village is located near a Boeing plant with a \$90 billion backlog, its value may inflate more than 3% a year. Moreover, the recent vacancy rate for the

	A	B	C	D	E	F	G	H	I	J	K	L	M
79	INVESTMENT ANALYSIS												
80			Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year
81			0	1	2	3	4	5	6	7	8	9	10
82	Cash flows												
83	Project cash flows	(\$1,572,000)	\$104,544	\$107,680	\$110,911	\$114,238	\$117,665	\$121,195	\$124,831	\$128,576	\$132,433	\$2,149,055	
84	Lender cash flows	(1,200,000)	108,000	108,000	108,000	108,000	108,000	108,000	108,000	108,000	108,000	1,308,000	
85													
86	Available for equity	(372,000)	(3,456)	(320)	2,911	6,238	9,665	13,195	16,831	20,576	24,433	841,055	
87													
88	Preferred distributions												
89	Preferred return	(300,000)	0	0	2,911	6,238	9,665	13,195	16,831	20,576	24,000	324,000	
90	Preferred excess		0	0	0	0	0	0	0	0	282	336,086	
91													
92	Preferred cash flows	(300,000)	0	0	2,911	6,238	9,665	13,195	16,831	20,576	24,282	660,086	
93													
94	Residual equity cash flow	(72,000)	(3,456)	(320)	0	0	0	0	0	0	152	180,969	
95													
96													
97													
98	Internal rates of return												
99													
100	Overall project return		9.28%										
101	Overall equity return		9.92%										
102	Preferred return		10.11%										
103	Residual return		9.15%										

Figure 3. The investment analysis. The lender (row 85) and preferred equity holders (row 90) each receive a prespecified chunk of the property's cash flows; the amounts are determined by the inputs in figure 1. If there's any money left over, the input in cell C40 determines how much preferred and residual equity holders will get.

property has hovered near 1%, far below the 5% rate assumed in the model. These figures make the deal look far more attractive.

Gambling on a rosy future for the

neighborhood can be dangerous, however, and in today's conservative banking climate, you may not be able to find a lender who's willing to play along. If you can't back up your optimistic assumptions

with cold cash, just keep on driving when you see Pine Village. **A**

Stephen L. Nelson is the author of *The Lotus 1-2-3 Money Manager* (Microsoft Press).

HOW TO SET UP THE REAL ESTATE INVESTMENT-ANALYSIS WORKSHEET

1. Releases

This model works in 1-2-3 Releases 2.x and 3.x and in *Symphony* Release 2.x.

2. Global settings

Column width: 10

1-2-3: /Worksheet Global Column-Width, enter 10

Symph: MENU Settings Width, enter 10, select Quit

Cell format: Comma 0
(Symph: Punctuated 0)

1-2-3: /Worksheet Global Format, type a comma, enter 0

Symph: MENU Settings Format Punctuated, enter 0, select Quit

3. Column widths

Column Width

A	14
B	12
C	12
M	11

For example, to set the width of column A, place the cell pointer in column A, select /Worksheet Column Set-Width (Symph: MENU Width Set), and enter 14.

4. Cell formats

Format	Range
Currency 0	D10..D12, C35, C38, C41, C43, D58..N58, C84..N84
Currency 2	D14, C20..C21
Percent 1	C23
(Symph: %1)	
Percent 2	C22, C28..C29, C36..C37, (Symph: %2) C39..C40, C48..C49, C100..C103

For example, to format cell D10 for Currency with no decimal places, select /Range Format Currency (Symph: MENU Format Currency), enter 0, and specify cell D10.

5. Labels

Enter the labels in figures 1, 2, and 3. Begin the labels in range A10..A12 and in cell C8 with an apostrophe ('). Begin the labels in ranges A15, A58..A60, A66..A68, and A90..A91 with two spaces.

Right-align the following ranges to match the figure: D7..D8, D54..N54, and C81..M81. For example, to right-align the labels in range D7..D8, select /Range Label Right (Symph: MENU Range Label-Alignment Right) and indicate range D7..D8.

To create the dashed lines, enter \- in cell A2 and copy it to the necessary ranges.

6. Values

Enter all the values in figure 1, except the values in cells C14, C43, and C49. Enter the values in cell D55 of figure 2 and in cell C82 of figure 3.

7. Formulas

Enter the following formulas. Some formulas will return 0 or ERR until you have built the entire model.

Cell Formula

C14	@SUM(C10..C12)
C43	+C35+C38+C41-(C35+C36)
C49	+D75/C43
E55	+D55+1
	Copy cell E55 to range F55..N55.
D58	(\$C10-\$D10+\$C11+\$D11+\$C12+\$D12)*12*(1+\$C28)^(D55-1)
D59	(\$C14-\$D14)*12*(1+\$C28)^(D55-1)
D60	-\$C23*(D58+D59)
D62	@SUM(D58..D60)
D66	(\$C14-\$C20*12)*(1+\$C29)^(D55-1)
D67	(\$C14-\$C21*12)*(1+\$C29)^(D55-1)
D68	+C22-D62
D70	@SUM(D66..D68)
D72	+D62-D70
	Copy range D58..D72 to range E58..N58.
M73	(N72/C49)*(1-C48)
D75	+D72/D73
D82	+C82+1
C84	-C43-(C35+C36)
C85	-C43

C87	+C84-C85
C90	-C38
C93	+C90+C91
C95	-C41
D84	+D75
D85	+\$C35+\$C37
D87	+D84-D85
D90	@MAX((@MIN(\$C38+\$C39,D87)),0)
D91	@MAX((D87-D90)-\$C40,0)
D93	+D90+D91
D95	+D87-D93

Copy range D75..D95 to range E75..M75.

M85	(\$C35+\$C37)-C85
M90	@MAX((@MIN(\$C38+\$C39,M87)),0)-C30
C100	@IRR(0.1,C84..M84)
C101	@IRR(0.1,C87..M87)
C102	@IRR(0.1,C93..M93)
C103	@IRR(0.1,C95..M95)

8. Modifying the model

To apply this model to a different property, change the model's income structure in range A10..D12 to match the new property, then modify the formula in cell D58 to reflect the new structure.

For example, to analyze a property with four types of units, place the cell pointer in row 12 of the completed model and select /Worksheet Insert Row (Symph: MENU Insert Rows) to insert an extra row in the model's *Income* section. Then enter the new unit descriptions, counts, and rents in range A10..D13. Finally, modify the formula in cell D59 (cell D58 of the original model) to read:

$$(\$C10-\$D10+\$C11+\$D11+\$C12+\$D12*\$C13-\$D13)*12*(1+\$C29)^(D56-1)$$

Copy this formula to range E59..M59.

If you insert more than one row, be sure to make the appropriate adjustment in the formula.

Then enter the expense, inflation, financing, and resale inputs relevant to your analysis.

To conduct an analysis with only one level of equity, enter 0 in cells C38, C39, and C40 and classify all equity as residual (cell C41).

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Update manufacturing-performance measurement with actual production figures.



BY RICHARD C. GENIS

For the month of May, Avocet Industries planned to build and sell 14,000 of its entry-level network analyzers and realize an operating income of \$97,130. The results are now in, and this fictional company has exceeded its goals in both sales revenue and operating income for network analyzers.

Everything seems fine, but gauging performance involves more than a quick glance at the bottom line. A careful look at May's performance shows that Avocet produced and sold 448 fewer analyzers than it planned. Although the higher-than-expected revenue may be good news,

lower production and sales could indicate potential problems, such as inefficient manufacturing or procuring.

Flexible budgeting offers a way to find out if Avocet's results are cause for celebration or soul-searching. It lets production managers compare the actual costs and income connected to a product with the budgeted costs and income, adjusted for the actual quantities produced. That way, managers can see if the reasons for a surplus or short-



The model described in this article is available on disk. See page 1 for details.

fall lie in the way the product is made or the way it's sold.

You can use the worksheet described in the setup box to create a model that lets you compare performance to targets with this flexible-budget approach.

The Flexible-Budget Worksheet

Figure 1 shows the worksheet's input area. Column D contains the budgeted values for May 1991, and column F lists the actual monthly results. Row 5 shows that Avocet planned to produce 14,000 analyzers but actually made 13,552.

Rows 7 and 8 record revenues from analyzer sales. For budgeting purposes, Avocet set the average selling price per analyzer at \$36 (cell D7), allowing that some will sell at a discount and others at list price. The number \$504,000 in cell D8 was computed by multiplying the average price by the budgeted number of analyzers, in cell D5. This value is only a point of reference. The actual sales revenue, \$525,000, appears in cell F8.

Rows 11 through 14 detail the analyzers' standard costs. The numbers in rows 11 and 12 are the established costs of materials and labor for one analyzer. For more on standard costs, see "Keeping a Lid on Production Costs" (March, page 44). As with sales revenue, the model tracks budgeted standard costs on a per-

piece basis. Rows 13 and 14 show the total material and labor costs. Cells D13 and D14 compute the direct material and labor costs budgeted for 14,000 analyzers. Like the number in cell D8, these figures act only as references. Cells F13 and F14 contain the material and labor costs for the 13,552 analyzers that are actually produced.

Rows 17 through 19 hold the budgeted and actual variable costs. The model records budgeted variable costs as a percentage of sales and separates variable costs into manufacturing, selling, and administrative components.

Variable manufacturing costs include all expenditures, other than direct material and labor costs, that are connected with producing goods and that vary with the quantity produced. These include packaging and operating supplies, as well as utilities and inspection expenses. Variable selling costs typically include sales commissions. Administrative costs tend to be fixed, but a small amount—1% of sales in this example—may be variable.

The actual amounts for variable costs are entered in range F17.F19 when the month is over and the company has totaled its expenditures.

Rows 22 to 24 contain fixed costs. Like variable costs, fixed costs have manufacturing, selling, and administrative components. Fixed manufacturing costs include

production supervision, material handling, and repair and maintenance of production equipment. Fixed selling costs include advertising and the salaries of sales personnel. Fixed administrative costs include benefits, the salaries of support personnel, rent, and utilities.

The Comparisons

Figure 2 shows the part of the worksheet that compares actual revenue and expenses (column F) with both the master budget (column D) and the flexible budget (column E).

The master budget consists of the amounts Avocet intended to earn and spend for the number of analyzers it planned to produce. Cell D37, for example, multiplies the value in cell D35 by the average per-unit selling price to determine the revenues Avocet expected from the sale of 14,000 analyzers.

Formulas in range D39..D43 compute the variable costs budgeted for 14,000 analyzers. The first two multiply the budgeted number of analyzers by the per-unit material and labor costs. The next three multiply the budgeted sales revenue (cell D37) by the variable-cost percentages. Cell D45 sums the variable costs. Cell D47 computes the master-budget contribution margin, the amount that making and selling the goods contributes to operating income. Formulas in range D50..D52 repeat the budgeted fixed costs from figure 1. Cell D54 sums the fixed costs, and cell D56 computes the budgeted operating income by subtracting total fixed costs from the contribution margin.

The flexible budget in column E reflects budgeted revenue and cost, adjusted for the amount of product actually built. Cell E37 computes the revenue Avocet would get by selling 13,552 analyzers at an average price of \$36. Cell E39 indicates that at budgeted levels, the materials for 13,552 analyzers should cost \$202,711. The formulas in column E are identical to those in column D, except that they're based on the actual figure of 13,552 analyzers instead of the original target of 14,000.

Column F records actual results. Most of the formulas in this column just repeat the values in the *Actual* column of the input section. This makes it easier to create and copy the variance formulas, and it arranges the actual values in the

	A	B	C	D	E	F	G
1	FLEXIBLE BUDGET FOR AVOCET INDUSTRIES						
2	May 1991						
3							
4	INPUT	SECTION		Budget		Actual	
5		Units of production		14,000		13,552	
6							
7		Average selling price		\$36.00			
8		Sales		\$504,000		\$525,000	
9							
10	Standard Costs						
11		Direct material/unit		\$14.958		NA	
12		Direct labor/unit		\$3.367		NA	
13		Direct material		\$209,412		\$203,911	
14		Direct labor		\$47,138		\$51,392	
15							
16	Variable costs						
17		Manufacturing		4.0%		\$23,000	
18		Selling		3.0%		\$16,000	
19		Administrative		1.0%		\$4,500	
20							
21	Fixed costs						
22		Manufacturing		\$65,000		\$64,575	
23		Selling		\$30,000		\$29,500	
24		Administrative		\$15,000		\$15,250	

Figure 1. Record the budgeted and actual costs and revenues for a product in this section of the worksheet.

	A	B	C	D	E	F	G	H	I	J	K
30	Comparison of Actual Results with Master Budget and Flexible Budget										
31											
32											
33				Master	Flexible	Actual	Master	Flexible		Sales	
34				Budget	Budget	Results	Budget	Budget		Volume	
35				14,000	13,552	13,552	(448)			Variance	
36				=====	=====	=====	=====	=====		(448)	
37	Units of production			\$504,000	\$487,872	\$525,000	\$21,000	\$37,128		(\$16,128)	
38				=====	=====	=====	=====	=====		=====	
39	Direct material			\$209,412	\$202,711	\$203,911	\$5,501	(\$1,200)		\$6,701	
40	Direct labor			\$47,138	\$45,630	\$51,392	(\$4,254)	(\$5,762)		\$1,508	
41	Var mfg costs			\$20,160	\$19,515	\$23,000	(\$2,840)	(\$3,485)		\$645	
42	Var selling costs			\$15,120	\$14,636	\$16,000	(\$880)	(\$1,364)		\$484	
43	Var admin costs			\$5,040	\$4,879	\$4,500	\$540	\$379		\$161	
44				=====	=====	=====	=====	=====		=====	
45	Total variable costs			\$296,870	\$287,370	\$298,803	(\$1,933)	(\$11,433)		\$9,500	
46				=====	=====	=====	=====	=====		=====	
47	Contribution margin			\$207,130	\$200,502	\$226,197	\$19,067	\$25,695		(\$6,628)	
48				=====	=====	=====	=====	=====		=====	
49	Fixed costs										
50	Manufacturing			\$65,000	\$65,000	\$64,575	\$425	\$425		\$0	
51	Selling			\$30,000	\$30,000	\$29,500	\$500	\$500		\$0	
52	Administrative			\$15,000	\$15,000	\$15,250	(\$250)	(\$250)		\$0	
53				=====	=====	=====	=====	=====		=====	
54	Total fixed costs			\$110,000	\$110,000	\$109,325	\$675	\$675		\$0	
55				=====	=====	=====	=====	=====		=====	
56	Operating income			\$97,130	\$90,502	\$116,872	\$19,742	\$26,370		(\$6,628)	
57				=====	=====	=====	=====	=====		=====	

Figure 2. This section computes master-budget and flexible-budget results and compares these with the actual revenue and expenses from figure 1, computing different types of variances to help you locate problem areas.

same format as the master and flexible budgets for easier comparison.

Columns G through I compute three types of variances. Column G computes master-budget variances, the differences between what Avocet planned to spend and receive in May and what it actually spent and received. Column H computes flexible-budget variances, the differences between what Avocet expected to spend and receive in producing 13,552 analyzers and what it actually spent and received in that endeavor. Cell H56 shows that the operating income was \$26,370 higher than Avocet expected for the actual number of analyzers produced. However, the negative values in range H39..H42 indicate higher-than-budgeted per-unit costs for materials, labor, and some variable items.

Column I computes sales-volume variances. The value -\$16,128 is the company's shortfall if the average price of the analyzers sold was closer to the budgeted figure of \$36. After the reduced variable costs of producing fewer units are factored in, the contribution margin is -\$6,628, as computed in cell I47. Because flexible-budget fixed costs don't vary from

master-budget fixed costs, the operating loss in this column is also -\$6,628.

Taken together, the variances show that even though Avocet produced fewer analyzers than planned and experienced production inefficiencies in making them, it posted a revenue surplus. The explanation may be that Avocet sold fewer analyzers than expected at a discount. The relative paucity of product may have helped prop up prices. This analysis shows that despite the extra revenue, Avocet must take steps to increase efficiency and total output.

Of course, some negative values can be accounted for by other factors. For example, the negative sales variance in cell J37 is the inevitable result of producing fewer units than planned.

Good News, Bad News

Just as a flexible-budget model can point out problems hiding behind a seemingly positive bottom line, it can also identify bright spots in what appears to be a bad situation. To see how this can happen, change the value in cell F8 to 501000 and press the CALC key. In this scenario, sales

for May are \$3,000 less than expected. But remember, the company made fewer analyzers than planned. Though the comparison section shows negative master-budget variances for sales and operating income, the flexible-budget variances are positive. The higher-than-expected prices kept the revenue shortfall smaller than predicted by the production shortfall.

A positive flexible-budget variance may also be caused by better-than-budgeted performance in the standard-cost and variable-cost categories. That is, the company built fewer products than planned but produced them more efficiently.

To use flexible budgeting with your company's data, replace the values in the model's input section with your numbers. Take care not to overwrite the formulas. As you examine the comparison section, look for negative values, which indicate that some area of the operation is not performing as well as planned. Such values may require investigation even in the face of otherwise positive results. ■

Richard C. Genis is a management consultant in Naperville, Ill., and an instructor of business at Aurora (Illinois) University. He wrote about standard costs in the March issue.

HOW TO SET UP THE FLEXIBLE-BUDGET WORKSHEET

1. Releases

This model works in 1-2-3 Releases 2.01, 2.2, 3, and 3.1 and in *Symphony* Releases 2.0 and 2.2.

2. Default settings

Recalculation: Manual

1-2-3: /Worksheet Global Recalculation Manual

Symph: MENU Settings Recalculation Method Manual Quit

Format: Currency 0

1-2-3: /Worksheet Global Format Currency, enter 0

Symph: MENU Settings Format Currency, enter 0, select Quit

3. Column widths

Column Width

Column	Width
A	6
B	15
C	8
D	11
E	10
F	11
G	10
H	10
I	10

For example, to set the width of column A, place the cell pointer in column A, select /Worksheet Column Set-Width (*Symph*: MENU Width Set), and enter 6.

4. Cell formats

Format Range

0 D5, F5, D35..I35

(*Symph*: Punctuated 0)

Currency 2 D7

Currency 3 D11..D12

Percent 1 D17..D19

(*Symph*: % 1)

For example, to assign the comma format to cell D5, select /Range Format and type a comma (*Symph*: MENU Format Punctuated), enter 0, and specify cell D5.

5. Labels

Enter the labels shown in columns A and B and in cells D4 and F4 of figure 1.

Enter the labels shown in columns A and B and in rows 30 to 35 of figure 2. In range D36..I36, enter a space followed

by one fewer equal signs than the width of the column. For example, column D has a width of 11, so enter a space followed by 10 equal signs in cell D36. Copy range D36..I36 to cell D57. In range D44..I44, enter a space followed by one fewer hyphens than the width of the column. Copy range D44..I44 to cells D46, D53, and D55.

Right-align the labels in cells D4 and F4 and in range D32..I34. For example, to right-align the label in cell D4, select /Range Label's Right (*Symph*: MENU Range Label-Alignment Right) and specify cell D4.

6. Values

Enter the values shown in figure 1 except for those in cells D8, D13, and D14.

7. Range names

Name Range

actsales	F8
actunits	F5
budsales	D8
budunits	D5
scslabor	D12
scsmat	D11
sellprice	D7
vcadm%	D19
vcmtg%	D17
vcsel%	D18

For example, to assign the name actsales to cell F8, press slash (*Symph*: MENU), select Range Name Create, enter actsales, and specify cell F8.

8. Cell formulas

Cell Formula

D8	+sellprice*budunits
F11	@NA
F12	@NA
D13	+scmat*budunits
d14	+scslabor*budunits
D35	+budunits
D37	+D35*\$sellprice

Copy cell D37 to cell E37.

D39	+D35*\$scmat
D40	+D35*\$scslabor
D41	+D37*\$vcmtg%
D42	+D37*\$vcsel%
D43	+D37*\$vcadm%

Copy range D39..D43 to cell E39.

D45 @SUM(D39..D43)

Copy cell D45 to range E45..F45.

D47 +D37-D45

Copy cell D47 to range E47..F47.

D50 +\$D22

Copy cell D50 to range D50..E52.

D54 @SUM(D50..D52)

Copy cell D54 to range E54..F54.

D56 +D47-D54

Copy cell D56 to range E56..F56.

E35 +actunits

F35 +actunits

F37 +actsales

F39 +F13

F40 +F14

F41 +F17

Copy cell F41 to range F42..F43.

F50 +F22

Copy cell F50 to range F51..F52.

G35 +F35-D35

Copy cell G35 to cells G37, G47, and G56.

G39 +D39-F39

Copy cell G39 to ranges G40..G43 and G50..G52 and to cells G45 and G54.

H37 +F37-E37

Copy cell H37 to cells H47 and H56.

H39 +E39-F39

Copy cell H39 to ranges H40..H43 and H50..H52 and to cells H45 and H54.

I35 +E35-D35

I37 +E37-D37

Copy cell I37 to cells I47 and I56.

I39 +D39-E39

Copy cell I39 to ranges I40..I43 and I50..I52 and to cells I45 and I54.

9. Save the file

To save the template with its formulas intact, select File Save (*Symph*: SERVICES File Save), type a file name that isn't already listed in the default directory, and press Return.

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CIRCLE 116 ON READER SERVICE CARD

Answers to Your Questions About Lotus Products

Revisited

Change file names

In the April issue (pages 60-61), we presented a macro that uses the DOS RENAME command and the [SYSTEM] command to automatically change the names of a series of files. The file names were in the sequential format IAS.000, IAS.001, IAS.002, and so on. Our macro renames all of the files except the one with the .000 extension. To change

the macro so that it will rename all of the files, edit the entry in cell B5 as follows:

[FOR ctr,0,999,1,rename]

Also, three of the cell entries in the figure should have been printed in color. They are cells B2, B3, and B8.

1-2-3

Print listed ranges

Q I want to print the contents of ranges whose names are listed in the

worksheet. I've tried a number of macro techniques but have had no success. Do you have any suggestions?

Barton J. Howell
Salt Lake City, Utah

A The macro in the figure at the top of page 70 prints every range whose name appears at the top of column C. There are other macros that will do the job, but this one is probably the most efficient.

To create the macro, enter labels as shown. Begin the entries in cells A9 and B9 with a label prefix. Omit for now the cell printed in

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CIRCLE 120 ON READER SERVICE CARD



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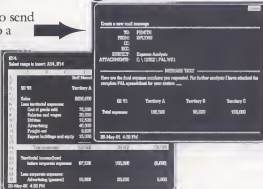
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	A	B	C	D	E	F	G	H
1			report1					
2			graphdat1					
3			report2					
4			graphdat2					
5								
6	currow							
7	currm	report1						
8								
9	\p	/PPA						
10		(FOR currow,0,@ROWS(rngnms)-1,1,print)						
11		Q						
12								
13	print	R(RECALC block){currm}"						
14		GP						

color (cell B7). Use the Range Name Labels Right command to assign the labels in column A as range names for the adjacent cells in column B. Then assign the name *rngnms* to range C1..C4 and the name block to range B6..B7. Enter the formula @INDEX (rngnms,0,currow) into the cell named *currm* (cell B7). To run the macro, hold down the MACRO key (Alt on most computers) and press P.

To run the macro with your own list of named ranges, replace the range names shown in column C. If you have several range names, you can use the Range Name Table command to generate a list of the range names in your worksheet and then delete the ones that don't refer to printable ranges. Use the Range Name Create command to reassign the name *rngnms* so that it includes all of the range names in your list. Don't delete the

range name before you reassign it.

This macro prints the ranges on consecutive pages. However, if you prefer that 1-2-3 reset page numbering to 1 for each range that it prints, add the letter A to the end of the commands in cell B14. The edited label will be *GPA*. If you want 1-2-3 to print each range immediately after the preceding one, omit the P in cell B14 so that it reads simply *G*.

Symphony

Sort in Symphony

Q We use *Symphony* Release 2.0. Can we sort records in the worksheet as we can in 1-2-3?

Gene Suponchick
Plains Cooperative Telephone Assoc. Inc.
Joel, Colo.

A In 1-2-3 you must assign an input range for database querying operations and a separate Data-Range for sorting operations. In *Symphony* you assign a Basic Database range for querying and sorting. You must include a row above the sort range. This row typically contains database field names, as shown in the following figure.

	A	B	C
1	Name	Phone	Office
2	Mangum	2446	208
3	Krieger	2439	201
4	Matthews	2434	203
5	Hannon	2430	207
6	Boyle	2440	205
7	Lubets	2447	202
8	Baumhauer	2495	204
9	Crupi	2433	203
10	Leahy	2462	206
11	Strout	2449	209

If your data lack field names, simply include a blank row above the data to sort when you indicate the database range. To sort the data in the preceding figure, in a *Symphony* SHEET window, select MENU Query Settings Basic Database and indicate A1..C11 as the range to sort. Select Quit from the resulting menu, then select Sort-Keys 1st-Key. Indicate a cell in the column of the database that *Symphony* should use to determine the sort order of the records. In this example, place the cell pointer in cell A2 and press Return. Then press A to arrange records in ascend-

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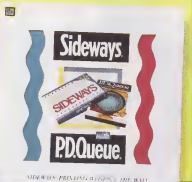
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ing order. Select Quit from the resulting menu, then select Record-Sort All Quit.

This is how your database should look after the sort:

	A	B	C
1	Name	Phone	Office
2	Baumhauer	2495	204
3	Boyle	2440	205
4	Crupi	2433	203
5	Hannon	2430	207
6	Krieger	2439	201
7	Leahy	2462	206
8	Lubets	2447	202
9	Mangum	2446	208
10	Matthews	2434	203
11	Strout	2449	209

@DATE function to a four-digit string. The first digit represents the last digit of the year, and the last three digits represent the day of the year. For example, if you enter the formula @DATE(91,6,2) into cell A1, your solution should return 1153 in cell C1. If you change the entry in cell A1 to @DATE(90,1,7), the formula in cell C1 should return 0007.

	A	B	C	D
1	02-Jun-91		1153	

The first 25 people who submit what the LOTUS judges consider the best answer will receive a LOTUS Swiss Army knife.

Please send a disk copy and a printed copy of your answer, with appropriate documentation. All entries must be postmarked before midnight, June 30, 1991. Winners will be announced in the September 1991 issue. Send your answers to **June Contest**, LOTUS Magazine, P.O.

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This material was prepared by Daniel Gas-teiger and the Technical Editors, with the help of the Lotus Customer Support staff.

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CIRCLE 123 ON READER SERVICE CARD

More Tips On Using Lotus Products

Revisited

3-line messages in Releases 2.2 and 3.x

In the September issue (page 94), Joel Weiss submitted a technique to display up to three lines of text at the top of the screen. But there is an error in the first line of the macro. Each time you run the macro, the command in cell B4 adds spaces to the label in *line1* so that it will appear left-justified. If you use *1-2-3 Release 2.2*, the error message *Invalid string value in INDICATE (B4)* appears the third time you invoke the macro. In Release 3.x, the message appears the seventh time you run the macro. This happens because *line1* contains too many characters. A cell entry cannot contain more than 240 characters in Release 2.2 and 512 characters in Release 3.x.

My additions to the macro below eliminate the problem. Note the new command in row 7 and the labels in row 14. Don't forget to assign all of the labels in column A as range names for the adjacent cells in column B.

These changes prevent the macro from repeatedly adding spaces to the message

in *line1*. You can run the macro any number of times and the error won't occur.

J. Mac Carraway
CPA Veytec Inc.
Orlando, Fla.

Quick fonts

Brian Griffith's suggestion (September, page 96) to assign fonts in *Allways* to certain symbol keys works. But it's hard to remember which key corresponds to which font. It's much easier to use the Alt key and the font number.

Font Number	Alt Combination
1	Alt-1
2	Alt-2
3	Alt-3
4	Alt-4
5	Alt-5
6	Alt-6
7	Alt-7
8	Alt-8

Following are other time-saving key combinations:

Alt-B	Bold (on/off)
Alt-G	Grid (on/off)
Alt-L	Lines (outline, all [with a range], none)

Alt-S	Shading (light, dark, solid)
Alt-U	Underlining (single, double, none)

To assign a font to a single cell, move the cell pointer to that cell and press the appropriate key combination. To assign a font to a range, move the cell pointer to the top-left corner of the range, press the period key to anchor the cell pointer, and highlight the range. Then press the appropriate key combination.

Kevin Cole
London, Ontario, Canada

Use this technique to assign any of the eight currently active fonts. To make another font active, select /Format Font and highlight the font you want to replace. Select Replace, choose a font type and size from the list, then select Quit.

DOS

Deleting files without mishap

Every computer user fears deleting an important file. I use a method that lets me make sure I am deleting only the files I really want to delete. First, I get a directory listing of these files.

For example, when I enter the following command at the DOS prompt, DOS displays a directory listing of all the files in the SAMPLE subdirectory that have the first four characters *test* and a .WK1 extension:

```
dir sample\test*.wk1
```

If these are indeed the files that I want to delete, I type *del* and press the F3 key. The F3 key repeats the characters that appeared after *dir* in the last DOS command.

Robert B. Kalinka
Grand Rapids, Mich.

	A	B	C	D	E	F	G	H
1	\a	(panelshow)						
2								
3	panelshow	(LET line1,+line1&@REPEAT(" ",80))						
4		(INDICATE line1)						
5		(MENCALL line2)						
6		(INDICATE)						
7		(LET line1,reset)						
8		(RETURN)						
9								
10	line1	First line						
11	line2	Second line						
12		Third line						
13								
14	reset	First line						

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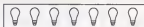
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CIRCLE 124 ON READER SERVICE CARD



You can also use the F3 key to repeat the previous DOS command in its entirety. This is handy when you want to copy several disks or display several directories from floppy disks.

Note that the DIR and DEL commands are equal in length. The F3 key replicates the second command in exactly the same character location as the previous command. Therefore, you can't use the F3 key to duplicate commands of unequal length. In the following example, you can't enter the first command and then use the F3 key to create the second command because the DIR and ERASE commands aren't the same length

```
dir b.model1.*
erase b.model1.*
```

1-2-3

Creating WK1 files in Release 3.x

1-2-3 Release 3.x saves cell format information in WK1 and WK3 files quite differently. In WK3 files, cell formats are saved in tables outside of the

actual worksheet. In WK1 files, cell formats are saved in the worksheet along with the formatted cell.

To see the effect this has on file size, in a blank worksheet, format range A:A1..A:Z100 for two decimal places. Select /Range Format Fixed, press Return to accept the default of two decimal places, and specify range A1..Z100 as the range to format. Save the file first as TESTWK3, then as TESTWK1. Select /System and enter *dir test.** at the DOS prompt in the directory containing your worksheet files. You'll see that the WK1 file is much larger. When I did this, my TESTWK3 file contained 1,679 bytes and my TESTWK1 file contained 25,583 bytes!

This difference in file size presents little trouble when files are relatively small, but it is possible to save a file in WK1 format that is too large to retrieve. If this happens, start with a blank worksheet and use the File Combine Copy Named/Specified-Range command to bring portions of the file in one at a time. Then save the file in WK3 format. If you must save the file in WK1 format, you may

need to reset some of the cell formats before you save the file.

Jeff Blaney
Lotus Development Corp.
Cambridge, Mass.

Speed up Release 3 printing

To speed up printing in 1-2-3 Release 3, change the location of 1-2-3's temporary print files to a new subdirectory off your root directory. Create the subdirectory, then select /Worksheet Global Default Temp and enter the name of the subdirectory. Be sure to select Update from the menu to save this change to 1-2-3's configuration file (123.CNF).

1-2-3 will print faster because access to an empty subdirectory off the root directory is faster than access to the 1-2-3 program directory.

Laurie Levine
Lotus Development Corp.
Cambridge, Mass.

For example, to create a subdirectory called 123TEMP off your root directory, enter *md \123temp* at the DOS prompt.

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Use @@ instead of Range Replace

I have several file-linking formulas that refer to the same file, and I need to change the file reference periodically.

For example, the following linking formula in the current worksheet returns the value of the cell named *total* from the file named MAYSL.WK3 in the C:\123 directory.

```
+<<c:\123\maysl.wk3>>total
```

I need to update the several linking formulas that refer to MAYSL.WK3 so that they return the value of *total* from JUNSL.WK3. I could edit the formulas or use the Range Search Formulas Replace command.

But I discovered that I could put the file name in a cell and refer to that cell in the file-linking formula. When I change the file name in the cell, the formulas should automatically adjust to refer to that new file name.

I devised a linking formula that uses the @@ function and concatenates the

file-link reference. The formula refers to a single-cell range that contains the file name.

I assigned the name *filelink* to a blank cell in the current worksheet, entered *maysl.wk3* into that cell, and entered the following formula into another cell. It returned the value of *total* from MAYSL.WK3.

```
@@("+"<<c:\123"&filelink">>total")
```

To return the value of *total* from a file named JUNSL.WK3, I changed the entry in *filelink* to *junsl.wk3*. The linking formula returned the contents of *total* from the file named JUNSL.WK3.

John Warrenner
Macon, Ga.

This file-linking technique doesn't work in 1-2-3 Release 2.2

Speed up file retrieval

When I'm working in a large spreadsheet in 1-2-3 Release 3 and I load another file with the File Retrieve command, it takes the program a long time to

retrieve that file. 1-2-3 appears to be removing the current worksheet from memory before retrieving the new file. If the new file is also large, I get the error message *Memory full*, and I have to reboot the system.

I discovered that if I erase the current worksheet before I retrieve a file, 1-2-3 retrieves the file much faster and I don't get the error message.

John Schiraga
Gloucester, Mass.

This material was prepared by the Technical Editors, with the help of the Lotus Customer Support staff.

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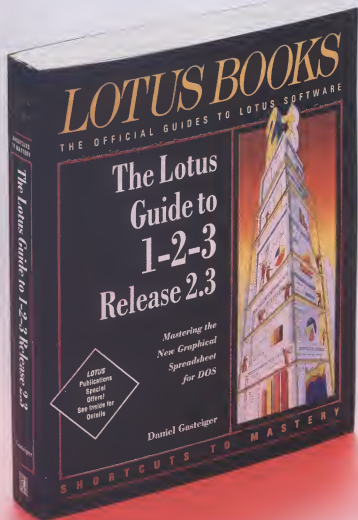


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GI = Good Ideas I&T = Ideas & Trends NP = New Products

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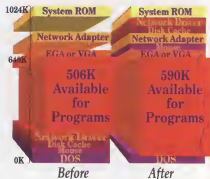
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Harvard Graphics vs. Freelance

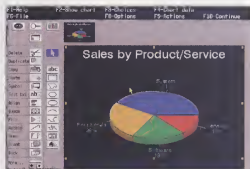
The top two presentation-graphics contenders climb into the ring for another round. And the winner is . . .

BY BILL LAWRENCE



Freelance 4.0's three-dimensional XYZ bar charts let you graph data along three axes (left).

Harvard Graphics 3.0 includes a new drawing environment for adding symbols, lines, and other embellishments to your graphs (right).



Software Publishing Corp. and Lotus Development Corp. have long been rivals in the presentation-graphics arena. With the recent rollout of Software Publishing's *Harvard Graphics* 3.0 and Lotus's *Freelance Graphics* for DOS 4.0, the competitors are ready for another contest in the DOS ring.

Who wins? We do. No matter which package you choose, creating high-quality graphics is now substantially less involved and time-consuming. Each new version represents a major upgrade, with significant added features and refinements. It's apparent that both Software Publishing and Lotus have been studying each other closely, and the feud threatens to intensify this fall, when both companies are slated to roll out *Windows* versions of their software.

So many of the new capabilities offered in these DOS releases mirror features already available from the competition that the two programs are now nearly identical in several areas. The best news for *1-2-3* users is that *Harvard Graphics* joins *Freelance* in offering an easy way to import data from spreadsheets, although *Harvard* doesn't support *1-2-3* Release 3.x file formats.

With so many similarities, how do you choose? If you are currently using one of these packages, stay the course and upgrade to the new release. It's cheaper than switching, and there isn't enough

difference in capabilities to justify a change. If you're new to presentation graphics, your decision will be harder. Although it costs \$100 more, *Harvard Graphics* offers powerful extra features such as animation, data-driven organization charts, and support for macros. If compatibility between your graphics package and WK3 files is more important than those extras, stick with *Freelance*.

What's New

Freelance comes to the ring with several big improvements, including reworked menu options that encourage the use of a mouse. The graphics package is now a fully WYSIWYG (what-you-see-is-what-you-get) environment. As users of earlier versions know, the text in *Freelance* graphics used to appear on-screen in a simple line-printer font, regardless of the text's actual font assignment. *Freelance*'s time-consuming preview option was the only way to view your graph in its final form. Now, as you construct a graph, *Freelance* displays it on-screen exactly as it will appear.

Freelance also includes a chart gallery, a popular feature that first appeared in *Harvard Graphics*. Rather than starting from scratch every time, you browse through a selection of ready-made templates and select a design that most closely matches the graph you want to build.

Bundled with *Freelance* is *GrandView LT*, a customized version of Symantec Corp.'s outline manager, which you can use to create outlines and quickly turn them into text graphics.

Software Publishing beefed up the spreadsheet support in *Harvard Graphics* so that you can more easily import data from *1-2-3* worksheets. Like *Freelance*, *Harvard Graphics* now lets you view a worksheet and mark the information to be imported. You can also create a link between the worksheet and your graph. Once your worksheet is updated, changes are automatically reflected in your graph when you next display it. Although no date has been set, support for *1-2-3* Release 3.x files will be added to a future release of *Harvard Graphics*, according to a Software Publishing spokesperson.

Harvard Graphics has always been considered a strong performer when called upon to graph data, but its drawing features were a bit anemic. Earlier versions relied on a separate program, *Draw Partner*. Now *Harvard* has a complete set of integrated drawing tools, presented via a graphical interface.

Numbers into Pictures

Like most *1-2-3* users, you'll probably use *Freelance* or *Harvard Graphics* to create two types of charts: those based on num-



bers and those that consist primarily of text. With either program, you can easily use a 1-2-3 worksheet as the basis for a graph by viewing it and marking the ranges that you wish to import. You can establish a link between your worksheet and graph so that the graph automatically reflects changes in the worksheet.

Both *Harvard Graphics* and *Freelance* take you far beyond the graphing capabilities of any 1-2-3 release. Consider the classic bar chart. With either package, you can create a chart with a three-dimensional look or display your data on three rather than two axes. You can display your data and graph together by including the data in a table below the bar chart.

You can use either product's chart gallery to view a selection of preconfigured chart styles. *Harvard Graphics*' library is the easiest to use. It appears as a menu option, so in one operation you can browse through more than 180 styles. The *Freelance* equivalent has the look of a last-minute retrofit. You can't get to it from a menu; you must retrieve and examine its 60 chart styles one gallery file at a time. Each file shows four chart styles, at most.

Fortunately, you can look through *Freelance*'s chart styles from inside a graph-creation screen. Say you've created a pie chart and want to see how the same data look as a stacked-bar graph. You can do so with a few mouse clicks or keystrokes. In *Harvard Graphics*, the only way to change the original style is to step back through the graph-creation process. You can retain the data you previously entered, however.

Text Charts

With either program, you create text charts simply by typing in a free-form fashion and picking a type font, size, and color. You can also select a predefined chart type, such as a bullet-item chart or a table, or choose a style from the chart gallery. *Harvard Graphics* lets you format your text in any of seven software fonts; *Freelance* provides two. You can purchase additional Bitstream fonts for use with either package.

Freelance users can switch with a few keystrokes or a mouse click into the *GrandView LT* outliner to create, edit, and spell-check an outline and then im-

UPGRADE HIGHLIGHTS

Harvard Graphics 3.0

- ★ Ability to view and mark 1-2-3 Release 2.x worksheets
- ★ Graphical drawing environment
- ★ Enhanced presentation-management tools
- ★ Background printing

Lotus Freelance 4.0

- ★ WYSIWYG environment
- ★ Chart gallery
- ★ Built-in outliner
- ★ 3-D bar charts

port it into *Freelance*, where it automatically becomes a series of bulleted charts. *Harvard* takes spell checking a step further by providing an internal checker.

If you like graphical user interfaces, you'll love the look of the *Harvard Graphics* drawing environment, which lets you add symbols, lines, arrows, and the like to your graphs. Symbols are a good way to add emphasis. A graph showing the number of computer types in use at your company, for example, could include a different symbol for each type. *Freelance*'s library offers more than 1,000 symbols; *Harvard Graphics*' offers 500.

If you opt to display your graphs in a screen show, *Harvard Graphics* also provides basic animation effects. You can embellish your presentation with such attention-getters as an airplane taking off, although this capability doesn't threaten to put the producers of Saturday-morning cartoons out of business.

Presentations

Freelance wins when it comes to visualizing what your chart will look like in printed form. While you are creating or editing a graph, you can switch to the WYSIWYG mode for the output device that you plan to use. *Freelance* automatically resizes the graph and changes its color scheme to match. In *Harvard Graphics*, you must select or create a color palette and a graph size to match your output device.

Graphs typically take a long time to print, so *Harvard Graphics*' new background-printing feature is a welcome ad-

dition. Printing a graph doesn't prevent you from doing other work within the program, as it does in *Freelance*.

Both *Freelance* and *Harvard Graphics* provide a plethora of presentation-management features, which let you work with a series of charts as a single unit. When you create a series of text graphs with *Freelance*'s *GrandView LT*, they are automatically collected into a presentation. *Harvard Graphics* offers its Auto-Build feature, which automatically saves a bullet chart as a series of separate files, each with a successive bullet item highlighted.

Harvard Graphics and *Freelance* each let you create screen shows that run either by themselves or under your keystroke control. *Harvard Graphics*' Hypershows feature lets you create graphs that include on-screen "buttons," which you select to branch to an alternate group of graphs. *Freelance* doesn't offer a Hypershows equivalent, but it does let you run floppy-disk-based screen shows on PCs on which *Freelance* is not installed.

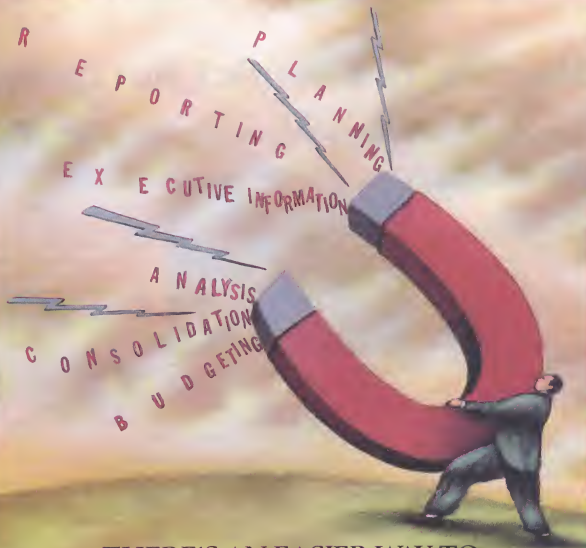
In this round of the presentation-graphs fight, *Harvard Graphics* and *Freelance* are very nearly tied. Both packages provide everything you need to easily produce the highest-quality graphics. Isn't competition wonderful? **D**

Bill Lawrence is a network engineer for a major electric utility in Southern California and a frequent contributor to *LOTUS*.

IN BRIEF

Lotus Freelance 4.0. Lotus Development Corp., 55 Cambridge Pkwy., Cambridge, MA 02142; 800-343-5414. Requires 640K of RAM and at least 7.8 megabytes of hard-disk space. \$495; upgrade, \$99. Server edition, \$695.00; network nodes, \$395 (must be used with one copy of server edition installed on server). Server-edition upgrade, \$150. Upgrade to future *Freelance* release for Windows, \$49. Six months of toll-free telephone support.

Harvard Graphics 3.0. Software Publishing Corp., P.O. Box 7210, 1901 Landings Dr., Mountain View, CA 94039-7210; 415-962-8910. Requires 640K of RAM and at least 8 megabytes of hard-disk space. \$595; upgrade from previous version, \$125. Single-node pack for networks, \$445; 5-node pack, \$2,115; 20-node pack, \$7,995. Node packs must be used with at least one copy of standard package installed on server. Unlimited non-toll-free telephone support.



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Macro Magic!s starter macros are helpful but won't have users pulling rabbits out of hats.

But like training wheels, *Macro Magic!* is a bit wobbly at times. The program's installation process, for example, won't work if you've customized I-2-3's default directory setting or if you use an AUTO123 file. If you need help during or after installation, your only recourse is to write a letter to *Macro Magic!*'s publisher. There is no telephone or Fax number for more-immediate support.

The nine macros in Move help you move and copy information and move the cell pointer. One macro copies data to a

■ **Macro Magic!**'s Macro Management System lets users import macros by choosing them from a list embedded in their worksheets.

The Print file includes a useful font-management routine that configures output for both laser and dot-matrix printers. The Misc file contains various data-sorting, search, and range-manipulation routines. Particularly interesting are the routines that assist you in building macros by helping you structure IF statements and menu branches and calls.

The Macro Management System is best suited for 1-2-3 novices and for those who have no intention of using the File Com-

A better, long-term alternative is *1-2-3 Release 2.2's Macro Library Manager*, which allows you to store routines in memory rather than embed them in individual worksheets. You can get similar results in Release 3 or 3.1 by placing macro routines in a macro library worksheet, which is retrieved via the File Open command.

How does *Macro Magic!* stack up against Macropac International's *101 Macros Plus*? For just \$10 more, *101 Macros* provides more macros, better documentation, and toll-free technical support. Even so, there's surprisingly little overlap in functionality between the programs. If prewritten macro libraries are a real work saver for you, consider buying both.

Macro Magic! Version 1.0. AmpliTech Inc., 1900 Clemson Dr., Richardson, TX 75081; 214-231-8149. \$59.95. 60-day warranty against defective disks. Technical support by written letter only.

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BY GARRY RAY

REVIEW of REVIEWS

Since the days of Johannes Gutenberg, publishers have reveled in their ink-stained aprons, weighty type trays, and untidy paste jars. For 500 years the publishing trade has been an arduous labor of exacting love, but today it's hard to find movable type anywhere but on a PC screen. Anyone with the right PC hardware and desktop-publishing software can produce books, newsletters, manuals, and even newspapers.

Among the top publishing packages are five that have garnered healthy coverage in the computer trade press: Aldus's *PageMaker*, Frame Technology's *FrameMaker*, Letraset's *DesignStudio*, Quark's *QuarkXPress*, and Ventura Publishing's *Ventura Publisher*. Four of these have been extensively updated since last year, and one, *DesignStudio*, is an entirely new offering.

Because of all the changes made in the contenders since last summer, the trade press had an awful time naming the "best" publishing package from one month to the next. The most the confused reader can do is draw a general picture of which program is good—or not so good—at a particular task.

The high-end products were reviewed extensively because of the ferocious pace of new versions and upgrades. Many of these reviews also serve as primers on publishing. Among the best are *Byte's* 11-page review of seven packages in October; *InfoWorld's* 16-page feature-by-feature analysis in the November 5 issue; and *The Seybold Report on Desktop Publishing's* 20-page comparison of three Macintosh programs—*PageMaker* 4.0,

QuarkXPress, and *DesignStudio*—with the DOS-based *Ventura Publisher Gold Series* in June 1990. A bevy of first looks and reviews appeared in *Publish*, *PC Week*, *InfoWorld*, and *PC Magazine*.

Unlike other types of software, desktop-publishing packages generally work with multiple hardware and operating-system platforms. Functionally, *PageMaker* 4.0 on the Macintosh is identical to *PageMaker* 4.0 running under Microsoft Windows, and you won't find a substantial difference between *FrameMaker* for the Next computer and *FrameMaker* for the Macintosh. *QuarkXPress*, long a Macintosh-only program, is being rewritten for the Windows environment. As a result, there is far less need to make distinctions among the Apple Macintosh, the Sun

Book publishing demands software with extensive, high-quality typographic controls. Infinitesimal letterspacing doesn't keep most of us awake at night, but for a book designer it's both a nightmare and a dream. The program must also handle the 200 to 500 pages that constitute a book, and some packages are better at it than others. Indexes and tables of contents are a must for book publishing as well, though add-on programs that create them are available from third-party developers.

Most desktop-publishing packages were originally intended to handle page layout—the art of arranging the final versions of text and art on pages. All but *FrameMaker* still follow the page-layout metaphor: You do most of your work in other programs, then pull those components into the publishing software. A good publishing package should accept files from a wide variety of graphics, word-processing, drawing, and database programs. It should also be able to check source files to make sure they haven't changed and automatically update the final document if they have.

The December issue of *Publish* claimed that *Ventura Publisher* could become "the dominant page-layout package for anyone who produces books, manuals or catalogs." In October *PC Magazine* said that *Ventura* "can perform typographic miracles on large documents," and *PC/Computing* wrote that *Ventura's* "tools for building and managing long documents are unmatched among PC-based desktop-publishing programs." But in March Aldus introduced *PageMaker* 4.0 for the Windows environment. *PageMaker's* Story Editor word processor brought universal acclaim, and its numerous typographic enhancements led the April 1 *InfoWorld* to say that

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Desktop publishing falls into three general categories: books, magazines, and newspapers; documentation, manuals, and reports; and newsletters, flyers, and brochures. Each requires a different set of features from a publishing package.

WHICH PUBLISHING PACKAGE IS RIGHT FOR YOU?

"PageMaker [4.0 for Windows] has matched Ventura in key areas such as typographic control." The March *PC/Computing* wrote, "Aldus has vastly improved control over typography."

Typography isn't everything, however. The paucity of other key features, primarily file handling, has made *QuarkXPress* and *DesignStudio* less suited for book publishing. *The Seybold Report on Desktop Publishing* warned in June 1990 that *QuarkXPress* 3.0 was not "as strong in editing or book-formatting features." Despite that, reviewers have consistently rated *QuarkXPress* as the best typographic program for the Macintosh. The October 30 issue of *MacWeek* asserted that "*QuarkXPress* 3.0 is the best product in terms of flexibility and power." Maybe, but not for books. *DesignStudio*, the new competitor of *QuarkXPress*, has "sophisticated typography," according to the November 5 *InfoWorld*, but reviewers at *MacWeek*, citing its sub-par file handling, said in October that they "would feel more comfortable designing spreads and smaller documents rather than longer files with *DesignStudio*."

The opposite balance of features—good file management, mediocre typography—makes *FrameMaker* another poor choice for book publishing. Though *FrameMaker* is highly rated for its marriage of publishing, file-handling, and word-processing features, including indexes and tables of contents, the January *Macworld* cautioned that "book publishers and others with stringent typographic requirements should think twice" before choosing it.

The consensus among reviewers seems to be that *Ventura Publisher*, in any of its multifarious new versions, works best for book-length documents. The Macintosh

With desktop-publishing products locked in a tight race, it's ludicrous to say that any one package is "best" for everyone's needs. You can, however, make some general distinctions among the top contenders by considering the job at hand.

Books. Book publishers think first of type, so their publishing package must handle leading, kerning, tracking, scaling, and other typographic concerns. *Ventura Publisher*, in its many editions for the Macintosh and the PC, generally maintains the optimal balance among typography, file handling, ease of use, and power. *PageMaker* 4.0 runs a very close second, and the battle between these two leaders shows no sign of waning.

Documentation, manuals, and reports. Typography is less exacting for such documents, but if you produce technical reports that include equations, *Ventura Publisher* stands out for the PC. *FrameMaker*, available for the Macintosh and a number of Unix systems, is the all-out leader for work-group documentation projects, and its equation editor makes it suitable for lengthy reports, as well. *PageMaker* 4.0 is probably the easiest package to use if you assemble files from many applications because it supports more than 50 external file formats.

Newsletters, flyers, and brochures. All the programs mentioned here, except *Ventura Publisher* and *FrameMaker*, are suitable for these layout-intensive applications. *DesignStudio* has the best mix of ease of use and layout control. *PageMaker* 4.0 offers the shortest learning curve and handles most layout tasks fairly efficiently: You simply plop components wherever you want them to appear. For sheer power, *QuarkXPress* is the acknowledged leader for layout tasks, but it has a fairly steep learning curve.

—G.R.

more graphic elements. Making sure that the document is continually updated and that all component files are included should be the job of the software, not the writers and editors.

Probably the most desirable package for creating documentation or manuals is *FrameMaker*. Unlike the other programs mentioned here, *FrameMaker* takes a word-processor approach—the word processor is the publishing package—reducing the need to gather text files created in other applications. According to the October issue of *Byte*, *FrameMaker* is "blessed with a host of features that you would want when working on a lengthy document." *Macworld's* January issue amplified that assessment: "Last-minute changes are simplified because everyone—in writing, editorial, and production—works on a single, live document."

Ventura Publisher and *PageMaker* 4.0 take different approaches to handling files. *PageMaker's* new "links management" facility notifies users of changes to an external text or graphic item, then lets them reimpart that updated item into the layout. *Ventura Publisher* maintains a two-way link with the external file: When you change text in the layout, the external file is automatically updated. Because of that simpler approach, *Ventura* has long reigned supreme with large-document publishers. In October *Byte* wrote, "Among the page-layout programs, *Ventura Publisher* gets the highest marks for document control." Yet opinions differ. In April *InfoWorld* stated that "*PageMaker* has matched *Ventura* in key areas such as typographic control, documentation features, and file management."

For more specialized documents, such as technical publications or indexes, the



choice gets a bit more complex. Despite a round of accolades, *PC World* said in February that *PageMaker* 4.0 "still lacks such key long-document features as a footnote facility, and the program can't match *Ventura*'s sophisticated cross-referencing or its equation editor." *InfoWorld* agreed, saying that *Ventura* "leads in specialized publishing features such as equation and table-editing," and in April added that *Ventura* "continues to boast superior documentation features such as frame anchoring and a more flexible, yet automated, layout approach." Anticipating *PC World*'s February assessment that "for scientific or highly technical publications, *Ventura* is still tops," *Publish* in December recommended *Ventura* "if you will be producing complex documents such as lengthy proposals, technical manuals, and even newsletters and small newspapers." Even so, *Publish* continued, "*FrameMaker* offers automatic formatting and equation editing that takes up where *Ventura* leaves off."

For 1-2-3 users, it may be that nothing is more important than placing spreadsheet data in a document. To accommodate that, *PageMaker* 4.0 includes a table editor that lets you load a 1-2-3 worksheet into the program and make changes, though not recalculate numbers, without reverting to 1-2-3. *Ventura* offers much the same capability, and in March

InfoWorld stated that "*Ventura* is especially well-suited to working extensively with tables." *FrameMaker* was panned on that count. The January *Macworld* noted that its table-editing method "is nowhere as intuitive and workable as, for instance, *Ventura Publisher*'s table editor." The March *PC/Computing* found the table

FOR 1-2-3 USERS, IT MAY BE THAT NOTHING IS MORE IMPORTANT THAN PLACING SPREADSHEET DATA IN A DOCUMENT.

editor in *PageMaker* 4.0 for *Windows* "a boon for spreadsheet jockeys looking to spice up their worksheets."

An interesting footnote on the *PageMaker* table editor was delivered in February by *Publish*, which explained that "*PageMaker* 4.0 for *Windows* tables accept data from a variety of sources, including tab-delimited text files or spread-

sheet file formats such as *Lotus 1-2-3* and *Microsoft Excel* (saved as *Lotus files*)." The April *InfoWorld* noted that *PageMaker* 4.0 can "import from 1-2-3, *dBase III Plus* and *IV*, *Quattro Pro* (via 1-2-3), and *Symphony*."

Those focusing on layout, design, and graphics—important in brochures, flyers, and other advertising materials—should consider *DesignStudio* for the Macintosh, which the November *InfoWorld* said "offers sophisticated typography and high-end graphics features such as free rotation drawing capabilities." Part-time or novice publishers might consider *PageMaker*, long known for its relative ease of use in designing layouts and incorporating graphical elements. Noting *QuarkXPress*'s steep learning curve, the October *Byte* said that it lets you "specify precisely where to place a frame [but] only if you need this level of control should you rule out *PageMaker*."

FrameMaker (in January *Macworld* called it "a poor choice for short-document designers") and *Ventura Publisher* (*InfoWorld* said "Xpress is a better value") offer strengths in other areas. Reviewers generally said that these programs lack graphical strength, however, making them less useful for design-intensive publications. **A**

Rowland Aertker provided research assistance for this article.

EXECUTIVE SUMMARY

PageMaker 4.0. Undoubtedly the most well-known desktop-publishing package, *PageMaker* 4.0 is available for both the Macintosh and the PC. Its accommodating layout tools make it a good choice for nonexperts, and recent upgrades have addressed many typographic, long-document, and editing complaints. \$795. Aldus Corp., 411 First Ave. S, Seattle, WA 98104; 800-333-2538; in Wash., 206-622-5500.

QuarkXPress 3.0. Among layout pros, *QuarkXPress* is to desktop publishing as the Turbo Carrera is to cars—fast and a little bit dangerous. With its outstanding typography and flexibility, this package for the Macintosh can handle just about any layout job. But learning *QuarkXPress* takes practice,

and its buggy track record can add a thrill to every layout session. A *Windows* version is in the works. \$895. Quark Inc., 300 South Jackson St., Denver, CO 80209; 303-934-2211.

DesignStudio 1.0. This new entry for the Macintosh sports a rich set of typographic controls that gives it fabulous potential. *DesignStudio* is easier to use than *QuarkXPress*, and it supports most of the design features professionals need. \$795. Letraset, 40 Eisenhower Dr., Paramus, NJ 07653; 800-343-8973.

Ventura Publisher. The ever-evolving *Ventura Publisher* continues to rank at the top for long documents requiring high-quality typography, and it now comes in versions for *Windows*

and the Macintosh. The program is not as useful for layout-intensive publishing jobs. \$795. Ventura Software, 15175 Innovation Dr., San Diego, CA 92128; 800-822-8221.

FrameMaker. This package for the Macintosh and Unix systems is noted for helping work groups produce long documents, such as manuals and documentation. Unlike other publishing packages, *FrameMaker* is a complete word environment that incorporates word-processing, layout, file management, and typographic facilities. However, the program is not recommended for small or layout-intensive jobs. \$995. Frame Technology Corp., 1010 Rincon Circle, San Jose, CA 95131; 800-843-7263; in Calif., 408-433-3311.

3-D Charts to Go!

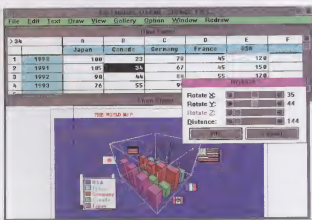
Spectacular Graphs for \$99.95

Microsoft Windows 3.0, the graphical user interface that is taking the world by storm, has finally inspired a simple, capable, and inexpensive graphics program. *3-D Charts To Go!*, from Bloc Publishing, provides all that anyone could ask from economical business-graphics software, for less than \$100.

3-D Charts covers all the bases. It makes creating and editing charts and graphics very easy. It lets you put external images and artwork in a chart. Plus, it works well with the world's most popular file format: the 1-2-3 WKS spreadsheet. The result is a potent little powerhouse that adds some nice enhancements to common business charting.

Creating graphs in *3-D Charts* is easy. First, you enter or import the data you intend to graph into *3-D Charts'* data sheet, which resembles a standard worksheet. The data sheet holds 40 rows by 8 columns of numbers or text, more than enough room for all but the most indecipherable images. Then you select the data to be charted from the Edit menu. The program lets you select the entire data sheet or just parts of it, such as column-by-column groups, row-wise slices, or larger blocks. Once you've made the selection, *3-D Charts* renders your data in three dimensions in a flash. The hardest part is learning the lexicon: The program refers to columns as *groups* and to rows as *sections*.

3-D Charts supports the four chart types found in most business-graphics programs: line, bar, area, and pie. It presents them in a separate chart sheet, but you can move between the data and chart sheets with just one keystroke. You can also tell *3-D Charts* to split the screen so that both sheets are permanently on view. In either case, the interaction be-



3-D Charts to Go! includes a chart window and a data window that make it easy to create business graphics.

tween the chart and data sheets is nearly instantaneous. Change a number, and the chart is immediately updated.

The program offers some perks not often seen in its price range. For example, swapping one column of data with another, which might make a chart easier to read, is a simple menu command. So, too, is the program's nifty solution to row-versus-column problems. A worksheet and its resulting graph might highlight a company's quarterly performance rather than the performance of particular line items. To reverse the emphasis, *3-D Charts* supplies a menu command that swaps all rows and columns: Column items become row items, and vice versa.

3-D Charts really shines in manipulating graphics. A single menu command selects a chart type. The commands to add labels, titles, footnotes, or descriptions to a chart bring up the same screen, in which you enter the text, select the type style, and add effects. Initially, *3-D Charts* presents charts in oblique, perspective, or isometric views. Slider bars let you modify these views by rotating the chart on its X, Y, or Z axes, and you can also alter the apparent distance from which the chart is viewed. Other controls

move and size the chart relative to the background.

Color and pattern controls make it easy to add distinctive tints and shades to various elements of a chart, including its background, bars, and labels. The Options menu alters the general proportion of the X, Y, and Z values; adds grids to the background axes; and adds scale markers to the individual bars in a chart. Automatic chart-scaling can be altered through the Options menu, as well.

3-D Charts has some other unexpected bonuses. A handy slide-show command called Present reads a series of chart files

and shows the images in any order you specify. Another nice touch is *3-D Charts'* ability to export charts in the Windows Metafile format, allowing you to incorporate a chart in yet another application, such as your word processor.

The program's use of external images adds a whole new dimension to business graphics. You can import images stored in the Metafile, bitmap (BMP), or PC Paintbrush (PCX) formats. No matter which format you work with, *3-D Charts* provides the tools to size the image for appealing integration with your charts.

Another pleasant surprise is the tidy elegance with which *3-D Charts'* many features are welded together. Even the newest Windows user will be up and running within a few hours of opening the package.

Windows, with its graphical user interface, has altered our expectations about the utility and power of PC software. We expect more now, and *3-D Charts to Go!* provides it.

—Garry Ray

3-D Charts to Go! Bloc Publishing, 800 Douglas Entrance, Executive Tower Penthouse, Coral Gables, FL 33134; 305-445-0903. \$99.95. Requires Microsoft Windows 3.0.

CIRCLE 1 ON READER SERVICE CARD

Procomm Plus: Stays Cheap, Gets Better

On its journey from shareware giveaway to software hit, Datastorm Technologies' *Procomm* has become the most popular communications program around. *LOTUS* readers gave it an unsalable thumbs-up in last December's Readers' Choice Awards, and Datastorm has made the program even better as *Procomm Plus 2.0*.

Although none of the new version's enhancements are groundbreaking, they once again place *Procomm* head and shoulders above its more expensive competitors. *Procomm Plus 2.0* adds the near-bulletproof Zmodem file-transfer protocol to its already impressive selection of 14 others. Zmodem, not generally found in telecommunications packages, moves files at amazing speeds with little chance of losing a connection. Its batch mode lets you transfer entire directories with only a few keystrokes. Zmodem is fast becoming the preferred protocol on remote systems across the country and bulletin-board services use it extensively.



Procomm Plus 2.0 includes an enhanced scripting language, the Zmodem file-transfer protocol, and better handling of its dialing directory.

Procomm users have always relied on third-party shareware programs to maintain their dialing directories. Version 2.0 adds directory sorting to its menu and lets you attach notes to any directory entry. *Procomm*'s Aspect scripting language has 100 new commands to handle the display, strings, file input and output, and math functions. A new compiler,

ASPCOMP, converts script files into smaller, faster, and unreadable ASX files. Passwords and account codes become unreadable during compilation, enhancing security. The Aspect manual, once part of the bulky *Procomm* manual, has been separated from the rest of the documentation.

Other, less dramatic enhancements make telecommunications easier to deal with. A file-name clipboard lets you cut bulletin-board file-name listings from the screen and paste them back to start a download. *Procomm* macro keys, now called "metakeys," let you attach Aspect scripts to a key combination rather than starting the script from a *Procomm* menu.

Whether you upgrade or start fresh, *Procomm* remains one of computing's best bargains.

—G.R.

Procomm Plus 2.0. Datastorm Technologies, 3212 Lemone Industrial Blvd., Columbia, MO 65201; 800-333-4559; in Mo., 314-443-3282. Requires DOS 2.0 or higher and 192K of RAM. \$119; upgrade from earlier *Procomm Plus* versions, \$39.

CIRCLE 2 ON READER SERVICE CARD

Geneva Financial Consolidation: Models for the New World Order

George Bush calls it the new world order. Europeans call it the European Economic Community. You might want to call it just good business. As international trade becomes the new business goal, more and more *I-2-3* users are seeking ways to adjust to a worldwide financial arena. Pizzano & Co.'s *Geneva Financial Consolidation* software is one way to keep up. *Consolidation*, a package of *I-2-3* Release 3.1 add-ins and templates, helps you build consolidation models that accurately reflect the structure of your company's operations and the world's fluctuating currencies.

You don't have to be a multinational company to use *Consolidation*; it's a handy package for any operation that gathers financial information from more than one source. With its flexible reporting capabilities, *Consolidation* will be as useful to the owner of a half-dozen stereo stores as to the bank that has 60 international branch offices.

Why not use *I-2-3* Release 3.1's own consolidation features? Pizzano's pack-

Variable	Description	Currency	Rate	Unit	Value
Entity	No. of Employees	USD	1.00	20	20
Entity	Payroll	USD	1.00	1200	1200
Entity	Payroll	USD	1.00	1200	1200

Geneva Financial Consolidation adds currency conversion and enhanced consolidation features to *I-2-3* Release 3.1.

age offers a simple currency-conversion feature that computes all currency values from a single column of numbers in an "entity tree sheet." *Consolidation* further simplifies things by showing, in outline form, the various entities that constitute your model and, by extension, your business. In addition to doing currency conversions, *Consolidation* uses the tree sheet to determine roll-ups from one

level of business to the next.

Consolidation also improves the method of building and reporting consolidations. In the program's "model definition sheet," you enter key words for all of the spreadsheet variables to be included in your consolidation. You then use this list of key words to extract data from line items in the component worksheets. You can also write simple English-like formulas that use these variables to create new line items, such as financial ratios or custom totals. A model definition sheet holds up to 48 variables.

The package's flexible report writer lets you specify precisely what information should be consolidated and the order and format in which it should appear. Reports are constructed as *I-2-3* worksheets, which you can further manipulate or simply print.

—G.R.

Geneva Financial Consolidation. Pizzano & Co., 800 W. Cummings Park, Woburn, MA 01801; 617-935-7122. \$495. Requires *I-2-3* Release 3.1 and 2 megabytes of RAM.

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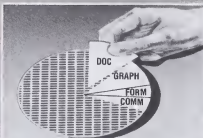
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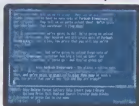
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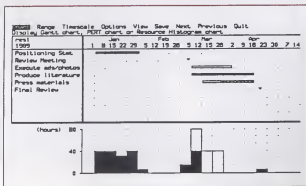
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	Yield	Term	Purchase in months:				Total		
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3-mo CDs	0.04	3	1, 2, 3, 4, 5			Earned:			
6-mo CDs	0.09	6	1			196531			
		1	2	3	4	5	6	Endowment	
Net Cash	400000	100000	100000	100000	100000	100000	100000	160000	
Minor Cash	0	0	10000	125332	49565	0	0	144700	
Interest	0	0	100	4113	49565	0	0	11824	
1-mo CDs	0	10000	30100	45085	0	0	15000		
3-mo CDs	95232								
6-mo CDs	125708								
Cash Uses	75000								
Net Cash	100000	-10000	-20000	00000	50000	-15000	60000		
End Cash	100000	100000	100000	100000	100000	100000	100000	156531	



Is Windows Worth It?

BY JUSTIN FIELDING

Fred, hang up your hair shirt. *Windows* 3.0 is the renaissance of DOS computing, so why not move out of the dark ages?

Unquestionably, a DOS-based machine can perform an impressive array of tasks. For most of us, though, it's more of a one-trick pony than a versatile workhorse because you start from scratch every time you try to learn an application.

Have you ever had to use an unfamiliar DOS program, perhaps to access a document created by a colleague? If you're wandering in *WordPerfect*, don't expect any help from the F1 key; on-line help hides out under F3. When you get stuck, don't try the Escape key; the software will counter with *Repeat Value=8*. It may as well proclaim *checkmate!* The chase is just as nerve-racking in *XyWrite*. On-line help is safely out of reach at Alt-F9, and if you dare press Escape, *XyWrite* retaliates by shooting an arrowhead into your text.

If these character-based diaphanous rain Detroit, you'd never know whether a turn of the wheel would steer the car, open the trunk, or make the dashboard hot enough to light a cigarette. In the *Windows* world, innovation is channeled into powerful new features and ease-of-use enhancements rather than into reinventing the wheel. The essentials are always the same in *Windows* applications. You never have to guess how to retrieve, save, print, copy, or get help.

You don't have to be a graphic artist to appreciate *Windows'* graphical user interface. The mouse is a handy way to select text, worksheet cells, menu options, and icons—those little pictures that identify important features and shortcuts. But *Windows* is also very friendly to the keyboard user.

Windows isn't just superior to DOS, it is DOS. It's a dandy task switcher and memory manager for your favorite character-based DOS applications. Programs like 1-2-3 for *Windows* give you the best of both worlds: superb *Windows* functionality and complete compatibility with DOS-based versions.

Windows has left the old C> prompt in the dust, and it's only going to get better. What are you waiting for? ■

Justin Fielding is senior editor of the Techniques department at LOTUS.

BY FREDRIC PAUL

Justin, don't get carried away. Despite all the hype, *Windows* is no panacea, and it's not for everyone.

Graphical user interfaces (GUIs) such as *Windows* 3.0 make sense for inherently graphical functions like desktop publishing, but they don't necessarily help people using DOS applications. Some applications—databases, word processors, and yes, spreadsheets—just aren't inherently graphical. They don't benefit all that much from a mouse and a pull-down menu.

In many cases, character-based programs are more efficient than their GUI equivalents. It's often quicker to issue a command than to click through a graphical sequence with a mouse. Copying a single file in DOS—assuming you know the name of the file, its location, and the proper command—is much faster and easier than performing the same task in *Windows*.

A GUI may make it easier to learn new applications by enforcing consistent behavior from program to program, but first you have to master the GUI. And, apart from computer-industry journalists, how many people really need to learn new applications all the time? Most people find one or two that fit their needs and stick with them.

Once you know your stuff, a move to *Windows* merely imposes another learning curve. The savings don't show up until you assemble a suite of *Windows* applications.

That's just not happening. Most people currently use *Windows* as a fancy way to switch among their DOS applications. They know that it's one thing to buy into a new environment and quite another to dump perfectly usable programs just because they're not graphical.

Windows itself may cost less than \$100, but think about all the additional hardware (more memory, faster processor, better display, bigger hard disk, mouse), software (*Windows* applications and utilities), and training you may need. If you're starting with a stripped-down '286 machine, moving to *Windows* can cost \$1,200 or more even before you shell out for a bunch of new applications.

GUI may eventually be the way to go, but for cost-conscious power users, DOS ain't dead yet. ■

Fredric Paul is senior editor of the Applications department at LOTUS.



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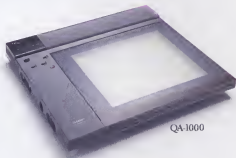
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